APPENDIX K

Post-Construction Surface Sediment Monitoring—Year 0

POST-CONSTRUCTION SURFACE SEDIMENT MONITORING—YEAR 0

Duwamish Sediment Other Area and Southwest Bank

Corrective Measure and Habitat Project

Boeing Plant 2, Seattle/Tukwila, Washington

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POST-CONSTRUCTION SURFACE SEDIMENT MONITORING—YEAR 0

Duwamish Sediment Other Area and Southwest Bank
Corrective Measure and Habitat Project
Boeing Plant 2, Seattle/Tukwila, Washington

1.0 INTRODUCTION

This report documents the results of Year 0 sediment quality monitoring conducted immediately after construction of the Duwamish Sediment Other Area (DSOA) and Southwest Bank Corrective Measure and Habitat Project was completed in March 2015. The monitoring program is being conducted to achieve two main objectives: (1) determine if recontamination of the clean, post-construction sediment surface is occurring; and (2) if recontamination is occurring, determine if the contaminants originate from on- or off-site sources.

Potential on-site sources are groundwater and stormwater, which are being monitored through the ongoing uplands Resource Conservation and Recovery Act (RCRA) process. No specific monitoring of groundwater is being conducted as part of this plan; however, sediments adjacent to stormwater outfalls in the Plant 2 vicinity are being sampled as part of sediment monitoring. Off-site sources include, but are not limited to, releases or resuspension of sediments and subsequent transport and deposition of those sediments from locations either upstream or downstream of the project area.

As described in the *Post-Construction Surface Sediment Monitoring Work Plan* (Work Plan; AMEC et al. 2014), post-construction monitoring was to be conducted immediately upon completion of all dredging, shoreline construction, and final backfilling to grade (Year 0). Additional monitoring will be conducted at years 1, 3, 5, 7, and 10 post-construction.

2.0 METHODS

Sediment samples were collected for chemical analysis from 36 sampling locations on the post-construction surface, as described in the work plan (AMEC et al. 2014).

2.1 SAMPLING DESIGN

The sampling design was a judgmental sampling design (i.e., sample locations were selected based on best professional judgment). The project area includes the in-water dredging areas (including Slip 4), the North and South Shoreline Areas below approximately +4 feet mean lower low water (MLLW), and the North and South Shoreline Areas above approximately +4 feet MLLW (Figure 1). The North and South Shoreline Areas above approximately +5 feet MLLW were planted with marsh

vegetation as part of restoration/creation of shoreline habitat within the DSOA and Southwest Bank area.

The 36 proposed sampling locations were selected to provide good spatial coverage of the post-construction surface and to include sampling points near stormwater outfalls (Figure 1). Sampling locations were stratified into five distinct groups based on the elevation of the post-construction surface.

- Shoreline area samples at approximately 7 feet MLLW;
- Shoreline area samples at approximately 4 feet MLLW;
- In-water work area sample locations above -5 feet MLLW and below +4 feet MLLW;
- In-water dredging area sample locations below -5 feet MLLW; and
- Stormwater outfall locations.

The elevations of the proposed sampling points were estimated using the design drawings for the designed final finish grade.

Elevation ranges for the stratified sampling groups were selected based on the mechanism and sources of potential off-site contaminants. Potential mechanisms of recontamination include releases, subsequent transport, and redeposition of contaminants from either upstream or downstream sources within the Duwamish Waterway. Transport of material from off-site sources in the waterway is stratified by water depth:

- Releases from upstream sources can potentially move downstream within the surface freshwater lens, and
- Releases within the tidally driven salt wedge can result in either upstream or downstream transport of contaminants.

The mechanisms influencing the sediment transport processes and the sources of potential contamination differ above and below the halocline (defined as the transition between the fresh, low-salinity surface layers and the higher salinity salt wedge). A majority of the water flow above the halocline in the Duwamish Waterway adjacent to Plant 2 is governed by surface freshwater flow, and sediment transport is predominantly downstream. The area below the halocline is predominately exposed to tidally driven flows that can result in either downstream or upstream water movement. Therefore, for monitoring purposes, the project area was divided into two strata, one above and one below the halocline.

The depth (or elevation) of the halocline depends primarily on the tidal height, tidal cycle, and river discharge rate. The elevation of the halocline in the vicinity of Plant 2 is estimated to be at approximately -5 feet MLLW, based on information collected by King County at the South Park Bridge between February 2006 and October 2011 (King County 2011). As such, the project area was divided into two subareas or strata (above -5 feet MLLW and below -5 feet MLLW; Figure 1) for monitoring purposes.

To meet the monitoring requirements of the Natural Resource Trustees, additional monitoring stations were established in the upper intertidal area within the North and South Shoreline Habitat Areas at an elevation of approximately +7 feet MLLW (Figure 1).

Finally, additional sampling stations were established adjacent to stormwater outfalls in the Duwamish Waterway and in Slip 4.

2.2 SAMPLE COLLECTION

Sediment sample collection followed the procedures specified in the Work Plan.

Samples collected in the areas at +4 feet MLLW and below, as shown on Figure 1, were collected using a 0.2-square-meter (m^2) stainless-steel powered grab sampler. These samples were collected within approximately 1 to 2 months of construction completion.

Samples collected at +7 feet MLLW, as shown on Figure 1, were collected by hand using stainless-steel spoons. Since the construction of the upper portion of the shoreline was completed in fall of 2013, these samples were collected approximately 1.5 years after construction completion.

2.3 ANALYTICAL LABORATORY

The analytical methods for sediment samples followed the requirements of the Work Plan and the *Final Construction Quality Assurance Project Plan* (AMEC et al. 2013). All samples were analyzed for the Sediment Management Standards (SMS; Washington Administrative Code 173-204) analytes, which include metals, polycyclic aromatic hydrocarbons (PAHs; low-molecular-weight PAHs [LPAHs] and high-molecular-weight PAHs [HPAHs]), chlorinated benzenes, phthalate esters, miscellaneous non-ionizable organic compounds, ionizable organic compounds, polychlorinated biphenyls (PCBs), and total organic carbon (TOC). Selected samples were also analyzed for dioxin/furans and grain size as described in the Work Plan.

3.0 RESULTS

3.1 SAMPLE COLLECTION

The Year 0 samples were collected at 36 locations; in addition, field duplicate samples were collected at four of the sample locations. A list of samples and coordinates of sampling locations are presented in Table 1, and approximate sampling locations are shown on Figure 1. At each sample location, the top 10 centimeters (cm) of sediment was collected for analytical chemistry. Samples that were collected for only SMS analysis were placed directly into a single sample container; these samples were homogenized at the analytical laboratory. Samples collected for analysis of SMS analytes and dioxin/furans or grain-size analysis were homogenized in the field before being placed into the sample containers.

3.2 SAMPLE PHYSICAL CHARACTERISTICS

The qualitative sample characteristics forms and photographs of the samples are provided in Attachment A.

There were 28 samples collected below elevation +4 feet MLLW, including six outfall samples. All samples consisted of fine to medium sand. Silt was observed on the surface of some of the samples (apparently recently deposited material) as described below:

- 15 samples had no silt layer present on the surface of the sample,
- 10 samples had a trace of silt present on the surface of the sample,
- 2 samples had an approximately 0.5-cm-thick layer of silt on the surface of the sample, and
- One sample had a 2- to 3-cm-thick layer of silt present on the surface of the sample (SD-PCM030).

Six samples were collected along the shoreline area at approximately +4 feet MLLW. Two of the samples were located in the north shoreline embayment (SD-PCM020 and SD-PCM021) and consisted primarily of silt. The embayment is a depositional area where construction was completed in fall 2013. The remaining four shoreline area samples collected at +4 feet MLLW consisted of fine to medium sand with no visible silt on the surface of the samples.

Six samples were collected along the shoreline at an elevation of approximately +7 feet MLLW. Two of the samples were located in the north shoreline embayment (SD-PCM031 and SD-PCM032) and the samples consisted predominantly of silt. As stated above, the north shoreline embayment is a depositional area where construction was completed in fall 2013. The other four shoreline sample locations consisted of fine to medium sand with no visible silt on the surface of the samples.

3.3 SEDIMENT CHEMISTRY

The chain-of-custody forms for the samples that were analyzed are provided in Attachment B. The results of the SMS analyses are presented in Table 2, dioxin/furan analyses are presented in Table 3, and grain-size analyses are presented in Table 4. The frequency of detection of the analytes are presented in Table 5.

3.3.1 Sediment Management Standards Analytes

3.3.1.1 Metals

Metals were analyzed in 40 samples, and all detected metals concentrations were well below the Washington Sediment Quality Standards (SQS; Table 2). Arsenic, chromium, copper, and zinc were detected in all the samples, and cadmium was detected in about one-half of the samples. Lead and mercury were detected in less than one-quarter of the samples, and silver was not detected.

3.3.1.2 PAHs

PAHs were analyzed in 40 samples, and all detected concentrations were well below the SQS (Table 2). PAHs were detected in 15 of the 40 samples. The most frequently detected PAHs were fluoranthene, pyrene, and dibenzo[a,h]anthracene (9 of 40, 8 of 40, and 8 of 40, respectively). Naphthalene, acenaphthylene, acenaphthene, fluorene, and 2-methylnaphthalene were detected in two or fewer of the samples (Table 5).

3.3.1.3 Chlorinated Benzenes

Chlorinated benzenes were analyzed in 40 samples, and the detected concentrations were well below the SQS (Table 2). Chlorinated benzenes were detected in four or fewer of the samples (Table 5).

3.3.1.4 Phthalate Esters

Phthalates were analyzed in 40 samples, and all detected concentrations were below the SQS (Table 2). All phthalates analyzed were detected in five or fewer samples, except butyl benzyl phthalate, which was detected in 12 of the 40 samples (Table 5).

3.3.1.5 Miscellaneous Non-Ionizable Organic Compounds

Miscellaneous non-ionizable organic compounds were analyzed in 40 samples, and the analyzed constituents were detected in three or fewer samples (Table 2 and Table 5). Concentrations of all detected compounds were below the SQS.

3.3.1.6 Ionizable Organic Compounds

Ionizable organic compounds were analyzed in 40 samples (Table 2). Phenol and benzoic acid were the most detected of the ionizable organic compounds (Table 5). Phenol was detected in 11 samples, and one sample with a concentration 570 micrograms per kilogram (µg/kg; SD-PCM032) exceeded the SQS of 420 µg/kg. Benzoic acid was detected in six samples, and three samples (680 µg/kg [SD-PCM031], 1,300 µg/kg [SD-PCM020], and 2,600 µg/kg [SD-PCM032]) exceeded the SQS of 650 µg/kg. Benzyl alcohol was detected in three samples, and one sample (SD-PCM032 [360 µg/kg]) exceeded the SQS of 57 µg/kg.

3.3.1.7 PCBs

Forty samples were analyzed for PCBs (Table 2). Aroclor 1254 and 1260 were the only Aroclors detected (3 of 40 and 5 of 40, respectively) in the samples, and total PCB concentrations were all below the SQS (Table 5).

3.3.1.8 TOC

TOC in the 40 samples that were analyzed ranged from 0.034 to 8.7 percent (Table 2 and Table 5).

3.3.2 Dioxins/Furans

Six samples were analyzed for dioxins/furans (Table 3). Several of the dioxin/furan congeners were detected (Table 5); however, the toxicity equivalences using one-half of the estimated detection limit were low and ranged from 0.07 to 0.37.

3.3.3 Grain Size

Six samples were analyzed for grain size (Table 4). Total fines in the samples ranged from 0.2 to 2.4 percent with an average of about 1.3 percent.

4.0 DATA QUALITY REVIEW

The chain-of-custody forms are provided in Attachment B. Results of the Stage 2B data validation are reported in Attachment C. A summary of the data validation is presented below.

4.1 PCB ANALYSES

The documentation was found to be clear and complete. The calibration data demonstrated acceptable instrument performance. The blank, surrogate, laboratory control samples (LCS), standard reference material (SRM), matrix spike/matrix-spike duplicate (MS/MSD), and field duplicate results demonstrated acceptable accuracy and precision. Two PCB results were qualified as estimated due to dual-column variability. The PCB data were acceptable for use as qualified.

4.2 METALS ANALYSES

The documentation was found to be clear and complete. The calibration data demonstrated acceptable instrument performance. The method blank, LCS, SRM, and MS results demonstrated acceptable laboratory accuracy. Several metals results were qualified as estimated based on lab and field duplicate variability. The metals data were acceptable for use as qualified.

4.3 SEMIVOLATILE ORGANIC ANALYSES

The documentation was found to be clear and complete. Several results were qualified as estimated due to continuing calibration results, blank contamination, and surrogate, LCS, and MS accuracy. Rejected results for benzyl alcohol and 2,4-dimethylphenol were replaced by acceptable or estimated results from re-extraction. Except for data replaced by results from another analysis, semivolatile organic data are acceptable for use as qualified.

4.4 SEMIVOLATILE ORGANIC SELECTIVE ION MONITORING (SIM) ANALYSES

The documentation was found to be clear and complete. The majority of results were accepted without qualification. Some results were qualified as estimated due to calibration results or surrogate or matrix-spike recoveries. Rejected results for benzyl alcohol and 2,4-dimethylphenol were replaced by acceptable or estimated re-extraction results. One result was qualified as presumed present due to poor spectral match. Except for data replaced by results from another analysis, semivolatile SIM organic data are acceptable for use as qualified.

4.5 DIOXIN/FURAN ANALYSES

The documentation was found to be clear and complete. No discrepancies were noted in analyte identification or result quantitation. The calibration data and system performance checks demonstrated acceptable instrument performance. The quality control results indicated acceptable accuracy. Blank contamination resulted in some estimated concentrations and elevated but acceptable reporting limits. The dioxin/furan data were acceptable for use as qualified.

4.6 GENERAL CHEMISTRY ANALYSES

The documentation was found to be clear and complete. The calibration data indicated acceptable performance. The method blank, LCS, SRM, and MS results demonstrated acceptable laboratory accuracy. Some data were qualified as estimated based on laboratory triplicate and field duplicate variability. The general chemistry results were acceptable for use as qualified.

4.7 GRAIN-SIZE ANALYSIS

The grain-size data were acceptable for use as reported.

5.0 SUMMARY

5.1 GRAIN SIZE

During placement of the final backfill, periodic exceedances of the turbidity criterion were recorded during water quality monitoring, suggesting a loss of the finer fraction of the backfill during placement. The average fines in the Year 0 samples was approximately 1.3 percent. The average fines in the sand backfill pre-placement quality assurance samples was 1.4 percent; however, the quality assurance analyses were conducted using a different sieve for the fines fraction (#200 [75 microns or µ] versus a #230 [63 µ] for the Year 0 samples), which overestimates the percent fines in the quality assurance samples as compared to the Year 0 samples. These data indicate that little or no measureable loss of fines occurred during placement of the final sand backfill.

5.2 CHEMISTRY

As described in the Statement of Basis (EPA 2011a) and the Final Decision and Response to Comments for the DSOA and Southwest Bank corrective action, the performance criteria were excavation to the target depth with subsequent backfilling with material that met the Final Media Cleanup Levels (EPA 2011b). Subsequent to EPA issuing the decision documents, EPA approved the backfill criteria that were presented in Table 3.1 of Appendix 3 of the EPA-approved Request for Approval of Quarry Sites (Floyd|Snider 2012).

The backfill material that was placed along the Plant 2 shoreline, within the DSOA, and in Slip 4 met the EPA-approved backfill criteria. Although the backfill criteria were for the material before it was placed, a comparison of the Year 0 samples to the backfill criteria provides additional confirmation that the corrective measure was constructed in accordance with the EPA decision documents. All of the sampling results presented in Section 3.3.1 were less than the backfill criteria, except for one phenol result, three benzoic acid results, and two total PCBs results.

Measured concentrations of benzoic acid, benzyl alcohol, and phenol in the approved compost material were greater than the backfill criteria (the approved backfill criteria for these constituents were equivalent to the SQS); thus, detections of phenol and benzoic acid in the Year 0 samples at levels greater than the SQS/LAET were not unexpected. EPA approved the use of compost material with elevated concentrations of benzyl alcohol, benzoic acid, and phenol in April 2013, with the understanding that these compounds are natural degradation products of woody debris, and are commonly found in plant matter and wood (Floyd|Snider 2013). Because the compost material used to amend the sand and gravel backfill was composed primarily of aged duff (i.e., leaves, branches, bark, and stems from the forest floor) and other clearings from forested areas, it was anticipated that these compounds may occasionally be present at levels higher than the backfill criteria (SQS) during subsequent sampling events.

The two total PCB results were higher than the backfill criterion of 30 µg/kg dry weight (i.e., SD-PCM020 and SD-PCM032) are located within the North Shoreline Area embayment. The embayment is a depositional area where construction was completed in the fall of 2013. The presence of PCBs 1½ years after construction completion at concentrations greater than the backfill criteria is believed to be a result of deposition of fine-grained material from upstream sources.

In context of these factors, the results of Year 0 sampling indicate that all requirements of the Statement of Basis (EPA 2011a) and the Final Decision and Response to Comments (EPA 2011b) were met.

6.0 REFERENCES

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TABLES

TABLE 1

POST-CONSTRUCTION SURFACE SAMPLE LOCATIONS—YEAR 0

Post-Construction Surface Sediment Monitoring—Year 0
Duwamish Sediment Other Area and Southwest Bank
Corrective Measure and Habitat Project
Boeing Plant 2
Seattle/Tukwila, Washington

Location	Sample ID	Date Sampled	WA State Plane, North Zone, NAD 83, Survey Feet	
			Easting	Northing
In-water Work Area Samples Above -5 feet MLLW and Below +4 feet MLLW				
SD-PCM001	SD-PCM00115	3/11/2015	1273101	198117
SD-PCM002	SD-PCM00215	3/10/2015	1273448	197828
SD-PCM003	SD-PCM00315	3/11/2015	1273602	197733
SD-PCM004	SD-PCM00415	3/11/2015	1273835	197481
SD-PCM005	SD-PCM00515	3/10/2015	1274228	197126
SD-PCM006	SD-PCM00615	3/10/2015	1274661	196749
SD-PCM206[1]	SD-PCM20615	3/10/2015	1274662	196745
SD-PCM007	SD-PCM00715	2/24/2015	1275013	196425
SD-PCM008	SD-PCM00815	2/24/2015	1275401	196073
SD-PCM009	SD-PCM00915	2/25/2015	1275768	195745
In-water Dredging Area Samples Below -5 feet MLLW				
SD-PCM010	SD-PCM01015	3/11/2015	1273238	198753
SD-PCM011	SD-PCM01115	3/10/2015	1272985	198189
SD-PCM012	SD-PCM01215	3/11/2015	1273308	197900
SD-PCM212[1]	SD-PCM21215	3/11/2015	1273312	197900
SD-PCM013	SD-PCM01315	3/10/2015	1273628	197610
SD-PCM014	SD-PCM01415	3/10/2015	1273948	197325
SD-PCM015	SD-PCM01515	3/11/2015	1274273	197031
SD-PCM016	SD-PCM01615	3/10/2015	1274643	196701
SD-PCM017	SD-PCM01715	2/24/2015	1274915	196454
SD-PCM018	SD-PCM01815	2/24/2015	1275232	196164
SD-PCM218[1]	SD-PCM21815	2/24/2015	1275230	196162
SD-PCM019	SD-PCM01915	2/24/2015	1275555	195875
Shoreline Area Samples at Approximately +4 feet MLLW				
SD-PCM020	SD-PCM02015	3/11/2015	1272994	198398
SD-PCM021	SD-PCM02115	3/11/2015	1272991	198281
SD-PCM022	SD-PCM02215	3/10/2015	1274829	196689
SD-PCM023	SD-PCM02315	2/24/2015	1275190	196374
SD-PCM223[1]	SD-PCM22315	2/24/2015	1275187	196373
SD-PCM024	SD-PCM02415	2/24/2015	1275484	195999
Outfall Samples				
SD-PCM025	SD-PCM02515	3/11/2015	1273046	198532
SD-PCM026	SD-PCM02615	3/10/2015	1274532	196926
SD-PCM027	SD-PCM02715	2/25/2015	1274768	196555
SD-PCM028	SD-PCM02815	2/24/2015	1275291	196096
SD-PCM029	SD-PCM02915	2/24/2015	1275490	195923
SD-PCM030	SD-PCM03015	2/25/2015	1275656	195748

TABLE 1

POST-CONSTRUCTION SURFACE SAMPLE LOCATIONS—YEAR 0

Post-Construction Surface Sediment Monitoring—Year 0
Duwamish Sediment Other Area and Southwest Bank
Corrective Measure and Habitat Project
Boeing Plant 2
Seattle/Tukwila, Washington

Location	Sample ID	Date Sampled	WA State Plane, North Zone, NAD 83, Survey Feet	
			Easting	Northing
Shoreline Area Samples at Approximately +7 feet MLLW				
SD-PCM031	SD-PCM03115	3/12/2015	1273065	198281
SD-PCM032	SD-PCM03215	3/12/2015	1273156	198222
SD-PCM033	SD-PCM03315	3/12/2015	1273298	197991
SD-PCM034	SD-PCM03415	3/12/2015	1275180	196440
SD-PCM035	SD-PCM03515	3/12/2015	1275310	196324
SD-PCM036	SD-PCM03615	3/12/2015	1275635	195921

Note(s)
1. Field duplicate.

Abbreviation(s)
MLLW = mean lower low water
NAD = North American Datum
WA State Plane = Washington State Plane Coordinates

TABLE 2

SEDIMENT MANAGEMENT STANDARDS CHEMICALS OF CONCERN ANALYTICAL RESULTS[1, 2]

Post-Construction Surface Sediment Monitoring—Year 0
Duwamish Sediment Other Area and Southwest Bank
Corrective Measure and Habitat Project
Boeing Plant 2
Seattle/Tukwila, Washington

Sampling Area		In-water Work Area Samples Above -5 ft MLLW and Below +4 ft MLLW																											
Location		SD-PCM001			SD-PCM002			SD-PCM003			SD-PCM004			SD-PCM005			SD-PCM006			SD-PCM206			SD-PCM007			SD-PCM008			SD-PCM009		
Monitoring Year		Year 0 (2015)			Year 0 (2015)			Year 0 (2015)			Year 0 (2015)			Year 0 (2015)			Year 0 (2015)			Year 0 (2015)			Year 0 (2015)			Year 0 (2015)			Year 0 (2015)		
Collection Date		3/11/2015			3/10/2015			3/11/2015			3/11/2015			3/10/2015			3/10/2015			3/10/2015			2/24/2015			2/24/2015			2/25/2015		
Sample Depth (ft)		0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33		
Sample ID		SD-PCM00115			SD-PCM00215			SD-PCM00315			SD-PCM00415			SD-PCM00515			SD-PCM00615			SD-PCM20615			SD-PCM00715			SD-PCM00815			SP-PCM00915		
Analyte	**SMS SQS Criteria [3]**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**
Conventionals																															
Total Organic Carbon (percent)	—	0.061			0.068			0.076			0.087			0.083			0.08			0.048			0.079			0.04			0.051		
Metals (mg/kg)																															
Arsenic	57	2			2.3			2.2			2.4			2			2			1.9			1.8			1.2			1.6		
Cadmium	5.1	0.3			0.3			0.2			0.2			0.2			0.2			0.2	U		0.2			0.2	U		0.2	U	
Chromium	260	18.9			16.2			18.3			18.1			19.4			16.2		J	20.7			20.9			17.9			15.9		
Copper	390	16.2			15.6			13.7			16			13.8			13.9			13			13.3			12.4			11.5		
Lead	450	2			2	U		2	U		2	U		2	U		2	U		2	U		2	U		2	U		2	U	
Mercury	0.41	0.02	U		0.02	U		0.02	U		0.03			0.02	U		0.02	U		0.02	U		0.03	U		0.03	U		0.02	U	
Silver	6.1	0.3	U		0.3	U		0.3	U		0.3	U		0.3	U		0.3	U		0.3	U		0.3	U		0.3	U		0.3	U	
Zinc	410	31			31			28			30			29			27			26			30			28			25		
Non-ionizable Organic Compounds																															
Aromatic Hydrocarbons (µg/kg)																															
Total LPAHs	5,200	20	U		20	U		20	U		20	U		19	U		19	U		19	U		19	U		20	U		18	U	
Naphthalene	2,100	20	U		20	U		20	U		20	U		19	U		19	U		19	U		19	U		20	U		18	U	
Acenaphthylene	1,300	20	U		20	U		20	U		20	U		19	U		19	U		19	U		19	U		20	U		18	U	
Acenaphthene	500	20	U		20	U		20	U		20	U		19	U		19	U		19	U		19	U		20	U		18	U	
Fluorene	540	20	U		20	U		20	U		20	U		19	U		19	U		19	U		19	U		20	U		18	U	
Phenanthrene	1,500	20	U		20	U		20	U		20	U		19	U		19	U		19	U		19	U		20	U		18	U	
Anthracene	960	20	U		20	U		20	U		20	U		19	U		19	U		19	U		19	U		20	U		18	U	
2-Methylnaphthalene	670	20	U		20	U		20	U		20	U		19	U		19	U		19	U		19	U		20	U		18	U	
Total HPAHs	12,000	40	U		40	U		40	U		40	U		60	J		38	U		39	U		2.5	J		39	U		37	U	
Fluoranthene	1,700	20	U		20	U		20	U		20	U		19	U		19	U		19	U		19	U		20	U		18	U	
Pyrene	2,600	20	U		20	U		20	U		20	U		19	U		19	U		19	U		19	U		20	U		18	U	
Benz[a]anthracene	1,300	20	U		20	U		20	U		20	U		19	U		19	U		19	U		19	U		20	U		18	U	
Chrysene	1,400	20	U		20	U		20	U		20	U		19	U		19	U		19	U		19	U		20	U		18	U	
Total benzofluoranthenes	3,200	40	U		40	U		40	U		40	U		10	J		38	U		39	U		37	U		39	U		37	U	
Benzo[a]pyrene	1,600	20	U		20	U		20	U		20	U		19	U		19	U		19	U		19	U		20	U		18	U	
Indeno[1,2,3-c,d]pyrene	600	20	U		20	U		20	U		20	U		6.5	J		19	U		19	U		19	U		20	U		18	U	
Dibenzo[a,h]anthracene	230	5	U		4.9	U		5	U		5	U		4.3	J		4.8	U		4.8	U		2.5	J		4.9	U		4.6	U	
Benzo[g,h,i]perylene	670	20	U		20	U		20	U		20	U		39			19	U		19	U		19	U		20	U		18	U	
Chlorinated Benzenes (µg/kg)																															
1,2-Dichlorobenzene	35	5	U		4.9	U		5	U		5	U		2.8	J		4.8	U		4.8	U		4.6	U		4.9	U		4.6	U	
1,4-Dichlorobenzene	110	5	U		4.9	U		5	U		5	U		2.5	J		4.8	U		4.8	U		4.6	U		4.9	U		4.6	U	
1,2,4-Trichlorobenzene	31	5	U		4.9	U		5	U		5	U		2.6	J		4.8	U		4.8	U		4.6	U		4.9	U		4.6	U	
Hexachlorobenzene	22	5	U		4.9	U		5	U		5	U		3.5	J		4.8	U		4.8	U		4.6	U		4.9	U		4.6	U	

TABLE 2

SEDIMENT MANAGEMENT STANDARDS CHEMICALS OF CONCERN ANALYTICAL RESULTS[1, 2]

Post-Construction Surface Sediment Monitoring—Year 0

Duwamish Sediment Other Area and Southwest Bank

Corrective Measure and Habitat Project

Boeing Plant 2

Seattle/Tukwila, Washington

Sampling Area		**In-water Work Area Samples Above -5 ft MLLW and Below +4 ft MLLW**																																	
Location		**SD-PCM001**			**SD-PCM002**			**SD-PCM003**			**SD-PCM004**			**SD-PCM005**			**SD-PCM006**			**SD-PCM206**			**SD-PCM007**			**SD-PCM008**			**SD-PCM009**					
Monitoring Year		**Year 0 (2015)**			**Year 0 (2015)**			**Year 0 (2015)**			**Year 0 (2015)**			**Year 0 (2015)**			**Year 0 (2015)**			**Year 0 (2015)**			**Year 0 (2015)**			**Year 0 (2015)**			**Year 0 (2015)**					
Collection Date		**3/11/2015**			**3/10/2015**			**3/11/2015**			**3/11/2015**			**3/10/2015**			**3/10/2015**			**3/10/2015**			**2/24/2015**			**2/24/2015**			**2/25/2015**					
Sample Depth (ft)		**0 - 0.33**			**0 - 0.33**			**0 - 0.33**			**0 - 0.33**			**0 - 0.33**			**0 - 0.33**			**0 - 0.33**			**0 - 0.33**			**0 - 0.33**			**0 - 0.33**					
Sample ID		**SD-PCM00115**			**SD-PCM00215**			**SD-PCM00315**			**SD-PCM00415**			**SD-PCM00515**			**SD-PCM00615**			**SD-PCM20615**			**SD-PCM00715**			**SD-PCM00815**			**SP-PCM00915**					
Analyte	**SMS SQS Criteria [3]**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**			
Phthalate Esters (µg/kg)																																			
Dimethyl phthalate	71	5	U		4.9	U		5	U		5	U		4.7	U		4.8	U		4.8	U		4.6	U		4.9	U		4.6	U				
Diethyl phthalate	200	20	U		20	U		20	U		23		J	19	U		19	U		19	U		19	U		20	U		20	B	U			
Di-n-butyl phthalate	1,400	20	U		20	U		20	U		20	U		19	U		19	U		19	U		19	U		20	U		18	U				
Butyl benzyl phthalate	63	5	U		4.9	U		5	U		5	U		2.9	J	J	4.8	U		4.8	U		5.3	Q	J	4.9	U		4.6	U				
Bis[2-ethylhexyl] phthalate	1,300	50	U		49	U		50	U		50	U		47	U		48	U		48	U		46	U		49	U		46	U				
Di-n-octyl phthalate	6,200	20	U		20	U		20	U		20	U		19	U		19	U		19	U		19	U		20	U		18	U				
Miscellaneous (µg/kg)																																			
Dibenzofuran	540	20	U		20	U		20	U		20	U		19	U		19	U		19	U		19	U		20	U		18	U				
Hexachlorobutadiene	11	5	U		4.9	U		5	U		5	U		2.4	J		4.8	U		4.8	U		4.6	U		4.9	U		4.6	U				
N-nitrosodiphenylamine	28	5	U		4.9	U		5	U		5	U		4.7	U		4.8	U		4.8	U		4.6	U		4.9	U		4.6	U				
Ionizable Organic Compounds (µg/kg)																																			
Phenol	420	20	U	UJ	20	U	UJ	20	U	UJ	20	U	UJ	10	J		19	U	UJ	19	U		19	U		20	U	UJ	18	U				
2-Methylphenol	63	5	U	UJ	4.9	U	UJ	5	U	UJ	5	U	UJ	4.7	U		4.8	U	UJ	4.8	U		4.6	U		4.9	U	UJ	4.6	U				
4-Methylphenol	670	20	U	UJ	20	U	UJ	20	U	UJ	20	U	UJ	19	U		19	U	UJ	19	U		19	U		20	U	UJ	18	U				
2,4-Dimethylphenol	29	25	U	UJ	25	U	UJ	25	U	UJ	25	U	UJ	23	U		24	U		24	U		23	U		24	U	UJ	23	U				
Pentachlorophenol	360	20	U	UJ	20	U	UJ	20	U	UJ	20	U	UJ	19	U	UJ	19	U	UJ	19	U		19	U		20	U	UJ	18	U				
Benzyl alcohol	57	20	U	UJ	20	U	UJ	20	U	UJ	20	U	UJ	19	U		19	U	UJ	19	U		19	U		20	U	UJ	18	U				
Benzoic acid	650	200	U	UJ	200	U	UJ	200	U	UJ	200	U	UJ	190	U		190	U	UJ	190	U		190	U		200	U	UJ	180	U				
PCBs (µg/kg)																																			
Aroclor 1016	NE	3.9	U		3.9	U		3.9	U		3.9	U		3.8	U		3.8	U		3.8	U		4	U		3.9	U		3.9	U				
Aroclor 1221	NE	3.9	U		3.9	U		3.9	U		3.9	U		3.8	U		3.8	U		3.8	U		4	U		3.9	U		3.9	U				
Aroclor 1232	NE	3.9	U		3.9	U		3.9	U		3.9	U		3.8	U		3.8	U		3.8	U		4	U		3.9	U		3.9	U				
Aroclor 1242	NE	3.9	U		3.9	U		3.9	U		3.9	U		3.8	U		3.8	U		3.8	U		4	U		3.9	U		3.9	U				
Aroclor 1248	NE	3.9	U		3.9	U		3.9	U		3.9	U		3.8	U		3.8	U		3.8	U		4	U		3.9	U		3.9	U				
Aroclor 1254	NE	3.9	U		3.9	U		3.9	U		3.9	U		3.8	U		3.8	U		3.8	U		4	U		3.9	U		3.9	U				
Aroclor 1260	NE	3.9	U		3.9	U		3.9	U		3.9	U		3.8	U		3.8	U		3.8	U		4	U		3.9	U		3.9	U				
Total PCBs (µg/kg Dry-Weight)	130	3.9	U		3.9	U		3.9	U		3.9	U		3.8	U		3.8	U		3.8	U		4	U		3.9	U		3.9	U				
Total PCBs (mg/kg OC) [4]	12	—			—			—			—			—			—			—			—			—			—					

TABLE 2

SEDIMENT MANAGEMENT STANDARDS CHEMICALS OF CONCERN ANALYTICAL RESULTS[1, 2]

Post-Construction Surface Sediment Monitoring—Year 0
Duwamish Sediment Other Area and Southwest Bank
Corrective Measure and Habitat Project
Boeing Plant 2
Seattle/Tukwila, Washington

Sampling Area		In-water Dredging Area Samples Below -5 ft MLLW																																	
Location		SD-PCM010			SD-PCM011			SD-PCM012			SD-PCM212			SD-PCM013			SD-PCM014			SD-PCM015			SD-PCM016			SD-PCM017			SD-PCM018			SD-PCM218			SD-PCM019		
Monitoring Year		Year 0 (2015)			Year 0 (2015)			Year 0 (2015)			Year 0 (2015)			Year 0 (2015)			Year 0 (2015)			Year 0 (2015)			Year 0 (2015)			Year 0 (2015)			Year 0 (2015)			Year 0 (2015)			Year 0 (2015)		
Collection Date		3/11/2015			3/10/2015			3/11/2015			3/11/2015			3/10/2015			3/10/2015			3/11/2015			3/10/2015			2/24/2015			2/24/2015			2/24/2015			2/24/2015		
Sample Depth (ft)		0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33		
Sample ID		SD-PCM01015			SD-PCM01115			SD-PCM01215			SD-PCM21215			SD-PCM01315			SD-PCM01415			SD-PCM01515			SD-PCM01615			SD-PCM01715			SD-PCM01815			SD-PCM21815			SD-PCM01915		
Analyte	**SMS SQS Criteria [3]**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**
Conventionals																																					
Total Organic Carbon (percent)	—	0.097			0.165			0.095			0.065			0.065			0.065			0.071			0.076		J	0.079		J	0.059		J	0.187			0.034		
Metals (mg/kg)																																					
Arsenic	57	1.9			3			2.3		J	1.6			2.2			2.2			1.9			2.1			2			5.7		J	3.1			1.5		
Cadmium	5.1	0.2			0.2			0.2	U		0.2	U		0.2			0.2			0.2	U		0.2	U		0.2	U		0.2	U		0.2	U		0.2	U	
Chromium	260	16.6			17.2			14.2			16.2			28.2			18.8			17		J	13.2		J	17.1		J	23.9		J	18.2			34.5		
Copper	390	17.9			13.4			13.1			12.7			14.3			15.5			12.6			13.2			12.2			12.6			13.5			14		
Lead	450	2	U		2	U		2	U		2	U		2	U		2	U		2	U		2	U		2	U		2	U		2			2	U	
Mercury	0.41	0.02	U		0.02	U		0.02	U		0.02	U		0.02	U		0.05			0.02	U		0.02	U		0.02	U		0.03	U		0.03	U		0.02	U	
Silver	6.1	0.3	U		0.3	U		0.3	U		0.3	U		0.3	U		0.3	U		0.3	U		0.3	U		0.3	U		0.3	U		0.3	U		0.3	U	
Zinc	410	29			26			27			25			30			34			30			25			26		J	29			32			28		
Non-ionizable Organic Compounds																																					
Aromatic Hydrocarbons (µg/kg)																																					
Total LPAHs	5,200	19	U		19	U		19	U		20	U		19	U		19	U		19	U		19	U		19	U		20	U		11	J		20	U	
Naphthalene	2,100	19	U		19	U		19	U		20	U		19	U		19	U		19	U		19	U		19	U		20	U		20	U		20	U	
Acenaphthylene	1,300	19	U		19	U		19	U		20	U		19	U		19	U		19	U		19	U		19	U		20	U		20	U		20	U	
Acenaphthene	500	19	U		19	U		19	U		20	U		19	U		19	U		19	U		19	U		19	U		20	U		20	U		20	U	
Fluorene	540	19	U		19	U		19	U		20	U		19	U		19	U		19	U		19	U		19	U		20	U		20	U		20	U	
Phenanthrene	1,500	19	U		19	U		19	U		20	U		19	U		19	U		19	U		19	U		19	U		20	U		11	J		20	U	
Anthracene	960	19	U		19	U		19	U		20	U		19	U		19	U		19	U		19	U		19	U		20	U		20	U		20	U	
2-Methylnaphthalene	670	19	U		19	U		19	U		20	U		19	U		19	U		19	U		19	U		19	U		20	U		20	U		20	U	
Total HPAHs	12,000	38	U		38	U		38	U		40	U		38	U		37	U		38	U		43	J		2.9	J		39	U		80	J		40	U	
Fluoranthene	1,700	19	U		19	U		19	U		20	U		19	U		19	U		19	U		4.8	J		19	U		20	U		17	J		20	U	
Pyrene	2,600	19	U		19	U		19	U		20	U		19	U		19	U		19	U		6.8	J		19	U		20	U		16	J		20	U	
Benz[a]anthracene	1,300	19	U		19	U		19	U		20	U		19	U		19	U		19	U		19	U		19	U		20	U		7.8	J		20	U	
Chrysene	1,400	19	U		19	U		19	U		20	U		19	U		19	U		19	U		19	U		19	U		20	U		12	J		20	U	
Total benzofluoranthenes	3,200	38	U		38	U		38	U		40	U		38	U		37	U		38	U		39	U		38	U		39	U		20	J		40	U	
Benzo[a]pyrene	1,600	19	U		19	U		19	U		20	U		19	U		19	U		19	U		19	U		19	U		20	U		6.9	J		20	U	
Indeno[1,2,3-c,d]pyrene	600	19	U		19	U		19	U		20	U		19	U		19	U		19	U		19	U		19	U		20	U		20	U		20	U	
Dibenzo[a,h]anthracene	230	4.8	U		4.8	U		4.8	U		5	U		4.8	U		4.7	U		4.8	U		4.6	J		2.9	J		4.9	U		4.9	U		5	U	
Benzo[g,h,i]perylene	670	19	U		19	U		19	U		20	U		19	U		19	U		19	U		27			19	U		20	U		20	U		20	U	
Chlorinated Benzenes (µg/kg)																																					
1,2-Dichlorobenzene	35	4.8	U		4.8	U		4.8	U		5	U		4.8	U		4.7	U		4.8	U		2.8	J		4.8	U		4.9	U		4.9	U		5	U	
1,4-Dichlorobenzene	110	4.8	U		4.8	U		4.8	U		5	U		4.8	U		4.7	U		4.8	U		2.8	J		4.8	U		4.9	U		4.9	U		5	U	
1,2,4-Trichlorobenzene	31	4.8	U		4.8	U		4.8	U		5	U		4.8	U		4.7	U		4.8	U		2.7	J		4.8	U		4.9	U		4.9	U		5	U	
Hexachlorobenzene	22	4.8	U		4.8	U		4.8	U		5	U		4.8	U		4.7	U		4.8	U		3.2	J		4.8	U		4.9	U		4.9	U		5	U	

TABLE 2

SEDIMENT MANAGEMENT STANDARDS CHEMICALS OF CONCERN ANALYTICAL RESULTS[1, 2]

Post-Construction Surface Sediment Monitoring—Year 0

Duwamish Sediment Other Area and Southwest Bank

Corrective Measure and Habitat Project

Boeing Plant 2

Seattle/Tukwila, Washington

Sampling Area		In-water Dredging Area Samples Below -5 ft MLLW																																			
Location		SD-PCM010			SD-PCM011			SD-PCM012			SD-PCM212			SD-PCM013			SD-PCM014			SD-PCM015			SD-PCM016			SD-PCM017			SD-PCM018			SD-PCM218			SD-PCM019		
Monitoring Year		Year 0 (2015)			Year 0 (2015)			Year 0 (2015)			Year 0 (2015)			Year 0 (2015)			Year 0 (2015)			Year 0 (2015)			Year 0 (2015)			Year 0 (2015)			Year 0 (2015)			Year 0 (2015)			Year 0 (2015)		
Collection Date		3/11/2015			3/10/2015			3/11/2015			3/11/2015			3/10/2015			3/10/2015			3/11/2015			3/10/2015			2/24/2015			2/24/2015			2/24/2015			2/24/2015		
Sample Depth (ft)		0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33		
Sample ID		SD-PCM01015			SD-PCM01115			SD-PCM01215			SD-PCM21215			SD-PCM01315			SD-PCM01415			SD-PCM01515			SD-PCM01615			SD-PCM01715			SD-PCM01815			SD-PCM21815			SD-PCM01915		
Analyte	**SMS SQS Criteria [3]**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**
Phthalate Esters (µg/kg)																																					
Dimethyl phthalate	71	4.8	U		4.8	U		4.8	U		5	U		4.8	U		4.7	U		4.8	U		2.7	J		4.8	U		4.9	U		4.9	U		5	U	
Diethyl phthalate	200	19	U		19	U		19	U		20	U		19	U		19	U		19	U		19	U		19	U		20	U		20	U		20	U	
Di-n-butyl phthalate	1,400	19	U		19	U		19	U		20	U		19	U		19	U		19	U		19	U		19	U		20	U		20	U		20	U	
Butyl benzyl phthalate	63	4.8	U		4.8	U		4.8	U		5	U		4.8	U		4.7	U		4.8	U		3.6	J	J	2.8	QJ	J	4.9	U		4.9	U		3.8	QJ	J
Bis[2-ethylhexyl] phthalate	1,300	48	U		48	U		48	U		50	U		48	U		47	U		48	U		48	U		48	U		49	U		33	J		50	U	
Di-n-octyl phthalate	6,200	19	U		19	U		19	U		20	U		19	U		19	U		19	U		19	U		19	U		20	U		20	U		20	U	
Miscellaneous (µg/kg)																																					
Dibenzofuran	540	19	U		19	U		19	U		20	U		19	U		19	U		19	U		19	U		19	U		20	U		20	U		20	U	
Hexachlorobutadiene	11	4.8	U		4.8	U		4.8	U		5	U		4.8	U		4.7	U		4.8	U		2.5	J		4.8	U		4.9	U		4.9	U		5	U	
N-nitrosodiphenylamine	28	4.8	U		4.8	U		4.8	U		5	U		4.8	U		4.7	U		4.8	U		4.8	U		4.8	U		4.9	U		4.9	U		5	U	
Ionizable Organic Compounds (µg/kg)																																					
Phenol	420	19	U	UJ	19	U	UJ	19	U	UJ	20	U	UJ	10	J		19	U		10	J		9.7	J		19	U		20	U	UJ	20	U		20	U	
2-Methylphenol	63	4.8	U	UJ	4.8	U	UJ	4.8	U	UJ	5	U	UJ	4.8	U		4.7	U		4.8	U		4.8	U		4.8	U		4.9	U	UJ	4.9	U		5	U	
4-Methylphenol	670	19	U	UJ	19	U	UJ	19	U	UJ	20	U	UJ	19	U		19	U		19	U		19	U		19	U		20	U	UJ	20	U		20	U	
2,4-Dimethylphenol	29	24	U	UJ	24	U	UJ	24	U	UJ	25	U	UJ	24	U		23	U		24	U		24	U		24	U		25	U	UJ	24	U		25	U	
Pentachlorophenol	360	19	U	UJ	19	U	UJ	19	U	UJ	20	U	UJ	19	U		19	U		19	U		19	U		19	U		20	U	UJ	20	U		20	U	
Benzyl alcohol	57	19	U	UJ	19	U	UJ	19	U	UJ	20	U	UJ	19	U		19	U		19	U		19	U		19	U		20	U	UJ	20	U		20	U	UJ
Benzoic acid	650	190	U	UJ	190	U	UJ	190	U	UJ	200	U	UJ	190	U		190	U		190	U		190	U		62	JQ	J	200	U	UJ	130	JQ	J	200	U	
PCBs (µg/kg)																																					
Aroclor 1016	NE	3.8	U		3.8	U		3.8	U		3.9	U		3.8	U		3.7	U		3.8	U		3.9	U		3.9	U		3.9	U		3.9	U		3.8	U	
Aroclor 1221	NE	3.8	U		3.8	U		3.8	U		3.9	U		3.8	U		3.7	U		3.8	U		3.9	U		3.9	U		3.9	U		3.9	U		3.8	U	
Aroclor 1232	NE	3.8	U		3.8	U		3.8	U		3.9	U		3.8	U		3.7	U		3.8	U		3.9	U		3.9	U		3.9	U		3.9	U		3.8	U	
Aroclor 1242	NE	3.8	U		3.8	U		3.8	U		3.9	U		3.8	U		3.7	U		3.8	U		3.9	U		3.9	U		3.9	U		3.9	U		3.8	U	
Aroclor 1248	NE	3.8	U		3.8	U		3.8	U		3.9	U		3.8	U		3.7	U		3.8	U		3.9	U		3.9	U		3.9	U		3.9	U		3.8	U	
Aroclor 1254	NE	3.8	U		3.8	U		3.8	U		3.9	U		3.8	U		3.7	U		3.8	U		3.9	U		3.9	U		3.9	U		5.2			3.8	U	
Aroclor 1260	NE	3.8	U		3.8	U		3.8	U		3.9	U		3.8	U		3.7	U		3.8	U		3.9	U		3.9	U		3.9	U		3.6	J		3.8	U	
Total PCBs (µg/kg Dry-Weight)	130	3.8	U		3.8	U		3.8	U		3.9	U		3.8	U		3.7	U		3.8	U		3.9	U		3.9	U		3.9	U		8.8	J	J [5]	3.8	U	
Total PCBs (mg/kg OC) [4]	12	—			—			—			—			—			—			—			—			—			—			—			—		

TABLE 2

SEDIMENT MANAGEMENT STANDARDS CHEMICALS OF CONCERN ANALYTICAL RESULTS[1, 2]
Post-Construction Surface Sediment Monitoring—Year 0
Duwamish Sediment Other Area and Southwest Bank
Corrective Measure and Habitat Project
Boeing Plant 2
Seattle/Tukwila, Washington

		Shoreline Area Samples at Approximately +4 ft MLLW																		
	Location	SD-PCM020			SD-PCM021			SD-PCM022			SD-PCM023			SD-PCM223			SD-PCM024		
	Monitoring Year	Year 0 (2015)			Year 0 (2015)			Year 0 (2015)			Year 0 (2015)			Year 0 (2015)			Year 0 (2015)		
	Collection Date	3/11/2015			3/11/2015			3/10/2015			2/24/2015			2/24/2015			2/24/2015		
	Sample Depth (ft)	0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33		
	Sample ID	SD-PCM02015			SD-PCM02115			SD-PCM02215			SD-PCM02315			SD-PCM22315			SD-PCM02415		
Analyte	**SMS SQS Criteria [3]**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**
Conventionals																			
Total Organic Carbon (percent)	—	2.07			0.118			0.052			0.034			0.054			0.037		
Metals (mg/kg)																			
Arsenic	57	4.8			2.5			1.7			1.7			1.6			1.9		
Cadmium	5.1	0.5			0.2			0.2			0.2	U		0.2			0.2		
Chromium	260	29.1			17.7			22.5			22.9			20.1			18		
Copper	390	36.8			15.9			14.1			12.9			13.9			17.5		
Lead	450	8			2	U		2	U		2	U		2	U		2	U	
Mercury	0.41	0.04			0.02	U		0.02	U		0.02	U		0.02	U		0.02	U	
Silver	6.1	0.5	U		0.4	U		0.3	U		0.3	U		0.3	U		0.3	U	
Zinc	410	64			32			26.8			28			30			33		
Non-ionizable Organic Compounds																			
Aromatic Hydrocarbons (µg/kg)																			
Total LPAHs	5,200	57	J		20	U		19	U		20	U		27	U		19	U	
Naphthalene	2,100	20	U		20	U		19	U		20	U		27	U		19	U	
Acenaphthylene	1,300	20	U		20	U		19	U		20	U		27	U		19	U	
Acenaphthene	500	20	U		20	U		19	U		20	U		27	U		19	U	
Fluorene	540	20	U		20	U		19	U		20	U		27	U		19	U	
Phenanthrene	1,500	43			20	U		19	U		20	U		27	U		19	U	
Anthracene	960	14	J		20	U		19	U		20	U		27	U		19	U	
2-Methylnaphthalene	670	20	U		20	U		19	U		20	U		27	U		19	U	
Total HPAHs	12,000	240	J		40	U		2.8	J		40	U		53	U		38	U	
Fluoranthene	1,700	49			20	U		19	U		20	U		27	U		19	U	
Pyrene	2,600	44			20	U		19	U		20	U		27	U		19	U	
Benz[a]anthracene	1,300	19	J		20	U		19	U		20	U		27	U		19	U	
Chrysene	1,400	35			20	U		19	U		20	U		27	U		19	U	
Total benzofluoranthenes	3,200	51			40	U		38	U		40	U		53	U		38	U	
Benzo[a]pyrene	1,600	11	J		20	U		19	U		20	U		27	U		19	U	
Indeno[1,2,3-c,d]pyrene	600	14	J		20	U		19	U		20	U		27	U		19	U	
Dibenzo[a,h]anthracene	230	5.2			5	U		2.8	J		5	U		6.6	U		4.8	U	
Benzo[g,h,i]perylene	670	12	J		20	U		19	U		20	U		27	U		19	U	
Chlorinated Benzenes (µg/kg)																			
1,2-Dichlorobenzene	35	4.9	U		5	U		4.7	U		5	U		6.6	U		4.8	U	
1,4-Dichlorobenzene	110	4.9	U		5	U		4.7	U		5	U		6.6	U		4.8	U	
1,2,4-Trichlorobenzene	31	4.9	U		5	U		4.7	U		5	U		6.6	U		4.8	U	
Hexachlorobenzene	22	4.9	U		5	U		4.7	U		5	U		6.6	U		4.8	U	

TABLE 2

SEDIMENT MANAGEMENT STANDARDS CHEMICALS OF CONCERN ANALYTICAL RESULTS[1, 2]
Post-Construction Surface Sediment Monitoring—Year 0
Duwamish Sediment Other Area and Southwest Bank
Corrective Measure and Habitat Project
Boeing Plant 2
Seattle/Tukwila, Washington

		Shoreline Area Samples at Approximately +4 ft MLLW																		
Location		**SD-PCM020**			**SD-PCM021**			**SD-PCM022**			**SD-PCM023**			**SD-PCM223**			**SD-PCM024**		
Monitoring Year		**Year 0 (2015)**			**Year 0 (2015)**			**Year 0 (2015)**			**Year 0 (2015)**			**Year 0 (2015)**			**Year 0 (2015)**		
Collection Date		**3/11/2015**			**3/11/2015**			**3/10/2015**			**2/24/2015**			**2/24/2015**			**2/24/2015**		
Sample Depth (ft)		**0 - 0.33**			**0 - 0.33**			**0 - 0.33**			**0 - 0.33**			**0 - 0.33**			**0 - 0.33**		
Sample ID		**SD-PCM02015**			**SD-PCM02115**			**SD-PCM02215**			**SD-PCM02315**			**SD-PCM22315**			**SD-PCM02415**		
Analyte	**SMS SQS Criteria [3]**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**
Phthalate Esters (µg/kg)																			
Dimethyl phthalate	71	4.9	U		5	U		4.7	U		5	U		6.6	U		4.8	U	
Diethyl phthalate	200	20	U		20	U		19	U		20	U		27	U		19	U	
Di-n-butyl phthalate	1,400	20	U		20	U		19	U		20	U		27	U		19	U	
Butyl benzyl phthalate	63	59			5	U		4.7	U		2.5	QJ	J	10	Q	J	4.8	U	
Bis[2-ethylhexyl] phthalate	1,300	110			50	U		47	U		50	U		66	U		48	U	
Di-n-octyl phthalate	6,200	20	U		20	U		19	U		20	U		27	U		19	U	
Miscellaneous (µg/kg)																			
Dibenzofuran	540	20	U		20	U		19	U		20	U		27	U		19	U	
Hexachlorobutadiene	11	4.9	U		5	U		4.7	U		5	U		6.6	U		4.8	U	
N-nitrosodiphenylamine	28	4.9	U		5	U		4.7	U		5	U		6.6	U		4.8	U	
Ionizable Organic Compounds (µg/kg)																			
Phenol	420	260			8.9	J		9.4	J		20	U		27	B	U	19	U	
2-Methylphenol	63	4.9	U		5	U		4.7	U		5	U		6.6	U		4.8	U	
4-Methylphenol	670	86			20	U		19	U		20	U		27	U		19	U	
2,4-Dimethylphenol	29	25	U		25	U		24	U		25	U		33	U		24	U	
Pentachlorophenol	360	13	J	J	20	U	UJ	19	U		20	U		27	U		19	U	
Benzyl alcohol	57	20	U		20	U		19	U		20	U		27	U		19	U	
Benzoic acid	650	1300		J	200	U		190	U		200	U		270	U		190	U	
PCBs (µg/kg)																			
Aroclor 1016	NE	3.8	U		4	U		4	U		3.9	U		3.9	U		3.9	U	
Aroclor 1221	NE	3.8	U		4	U		4	U		3.9	U		3.9	U		3.9	U	
Aroclor 1232	NE	3.8	U		4	U		4	U		3.9	U		3.9	U		3.9	U	
Aroclor 1242	NE	58	Y	UY	4	U		4	U		3.9	U		3.9	U		3.9	U	
Aroclor 1248	NE	3.8	U		4	U		4	U		3.9	U		3.9	U		3.9	U	
Aroclor 1254	NE	30	P	J	4	U		4	U		3.9	U		3.9	U		3.9	U	
Aroclor 1260	NE	27			4	U		4	U		3.9	U		3.9	U		3.9	U	
Total PCBs (µg/kg Dry-Weight)	130	57		J [5]	4	U		4	U		3.9	U		3.9	U		3.9	U	
Total PCBs (mg/kg OC) [4]	12	2.8		J [6]	—			—			—			—			—		

TABLE 2

SEDIMENT MANAGEMENT STANDARDS CHEMICALS OF CONCERN ANALYTICAL RESULTS[1, 2]

Post-Construction Surface Sediment Monitoring—Year 0
Duwamish Sediment Other Area and Southwest Bank
Corrective Measure and Habitat Project
Boeing Plant 2
Seattle/Tukwila, Washington

Sampling Area		Outfall Samples																Shoreline Area Samples at Approximately +7 ft MLLW																	
Location		SD-PCM025			SD-PCM026			SD-PCM027			SD-PCM028			SD-PCM029			SD-PCM030			SD-PCM031			SD-PCM032			SD-PCM033			SD-PCM034			SD-PCM035			SD-PCM036		
Monitoring Year		Year 0 (2015)			Year 0 (2015)			Year 0 (2015)			Year 0 (2015)			Year 0 (2015)			Year 0 (2015)			Year 0 (2015)			Year 0 (2015)			Year 0 (2015)			Year 0 (2015)			Year 0 (2015)			Year 0 (2015)		
Collection Date		3/11/2015			3/10/2015			2/25/2015			2/24/2015			2/24/2015			2/25/2015			3/12/2015			3/12/2015			3/12/2015			3/12/2015			3/12/2015			3/12/2015		
Sample Depth (ft)		0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33		
Sample ID		SD-PCM02515			SD-PCM02615			SD-PCM02715			SD-PCM02815			SD-PCM02915			SD-PCM03015			SD-PCM03115			SD-PCM03215			SD-PCM03315			SD-PCM03415			SD-PCM03515			SD-PCM03615		
Analyte	**SMS SQS Criteria [3]**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**
Conventionals																																			
Total Organic Carbon (percent)	—	0.054			0.058			0.072			0.036			0.049			0.168			2.65			8.7			0.47			1.19			1.46			0.97		
Metals (mg/kg)																																			
Arsenic	57	1.8			1.7			1.4		J	2.1			2.4			1.6			2.8			15			1.3			3.2			3.3			2.4		
Cadmium	5.1	0.2	U		0.2			0.2	U		0.2	U		0.2			0.2			0.3			1	U		0.3			0.2	U		0.2	U		0.3		
Chromium	260	14.5			19.7			15.9			18.4			28			30			18.9			27			26.8			20.9			19.1			23.2		
Copper	390	11.7			17.6			11.1			12.3			13.8			15.5			24.6			50			22.9			19.3			20			22.6		
Lead	450	2	U		2	U		2	U		2	U		2			2	U		4			20			2	U		4			3			5		
Mercury	0.41	0.03	U		0.04			0.02	U		0.02	U		0.02	U		0.02	U		0.03	U		0.1			0.02	U		0.03	U		0.02	U		0.02		
Silver	6.1	0.3	U		0.3	U		0.3	U		0.3	U		0.3	U		0.3	U		0.4	U		2	U		0.3	U		0.3	U		0.3	U		0.4	U	
Zinc	410	25			28			25			26			33			26			35			138			30			31			30			34		
Non-ionizable Organic Compounds																																			
Aromatic Hydrocarbons (µg/kg)																																			
Total LPAHs	5,200	19	U		20	U		19	U		19	U		19	U		20	U		121	J		296			18	U		34			54.1	J		13	J	
Naphthalene	2,100	19	U		20	U		19	U		19	U		19	U		20	U		12	J		56			18	U		20	U		19	U		19	U	
Acenaphthylene	1,300	19	U		20	U		19	U		19	U		19	U		20	U		19	U		20	U		18	U		20	U		19	U		19	U	
Acenaphthene	500	19	U		20	U		19	U		19	U		19	U		20	U		17	J		20	U		18	U		20	U		5.6	J		19	U	
Fluorene	540	19	U		20	U		19	U		19	U		19	U		20	U		18	J		20	U		18	U		20	U		7.5	J		19	U	
Phenanthrene	1,500	19	U		20	U		19	U		19	U		19	U		20	U		68			130			18	U		34			41			13	J	
Anthracene	960	19	U		20	U		19	U		19	U		19	U		20	U		5.8	J		110			18	U		20	U		19	U		19	U	
2-Methylnaphthalene	670	19	U		20	U		19	U		19	U		19	U		20	U		6.7	J		20	U		18	U		20	U		19	U		19	U	
Total HPAHs	12,000	38	U		4.3	J		12	J		37	U		38	U		6.9	J		86	J		629			37	U		32	J		41.5	J		25	J	
Fluoranthene	1,700	19	U		20	U		19	U		19	U		19	U		6.9	J		33			140			18	U		16	J		20			14	J	
Pyrene	2,600	19	U		20	U		19	U		19	U		19	U		20	U		27			130			18	U		16	J		14	J		11	J	
Benz[a]anthracene	1,300	19	U		20	U		19	U		19	U		19	U		20	U		19	U		40			18	U		20	U		19	U		19	U	
Chrysene	1,400	19	U		20	U		19	U		19	U		19	U		20	U		12	J		110			18	U		20	U		7.5	J		19	U	
Total benzofluoranthenes	3,200	38	U		39	U		39	U		37	U		38	U		40	U		14	J		130			37	U		40	U		37	U		37	U	
Benzo[a]pyrene	1,600	19	U		20	U		19	U		19	U		19	U		20	U		19	U		37			18	U		20	U		19	U		19	U	
Indeno[1,2,3-c,d]pyrene	600	19	U		20	U		19	U		19	U		19	U		20	U		19	U		29			18	U		20	U		19	U		19	U	
Dibenzo[a,h]anthracene	230	4.7	U		4.3	J		4.8	U		4.6	U		4.7	U		4.9	U		4.8	U		13			4.6	U		5	U		4.7	U		4.6	U	
Benzo[g,h,i]perylene	670	19	U		23			12	J		19	U		19	U		20	U		19	U		20	U		18	U		20	U		19	U		19	U	
Chlorinated Benzenes (µg/kg)																																			
1,2-Dichlorobenzene	35	4.7	U		3.3	J		4.8	U		4.6	U		4.7	U		4.9	U		4.8	U		3.5	J		4.6	U		5	U		4.7	U		4.6	U	
1,4-Dichlorobenzene	110	4.7	U		3.4	J		4.8	U		4.6	U		4.7	U		4.9	U		4.8	U		5	U		4.6	U		5	U		4.7	U		4.6	U	
1,2,4-Trichlorobenzene	31	4.7	U		3.5	J		4.8	U		4.6	U		4.7	U		4.9	U		4.8	U		5	U		4.6	U		5	U		4.7	U		4.6	U	
Hexachlorobenzene	22	4.7	U		3.8	J		4.8	U		4.6	U		4.7	U		4.9	U		4.8	U		5	U		4.6	U		5	U		4.7	U		4.6	U	

TABLE 2

SEDIMENT MANAGEMENT STANDARDS CHEMICALS OF CONCERN ANALYTICAL RESULTS[1, 2]

Post-Construction Surface Sediment Monitoring—Year 0
Duwamish Sediment Other Area and Southwest Bank
Corrective Measure and Habitat Project
Boeing Plant 2
Seattle/Tukwila, Washington

		Sampling Area	Outfall Samples																Shoreline Area Samples at Approximately +7 ft MLLW																	
		Location	SD-PCM025			SD-PCM026			SD-PCM027			SD-PCM028			SD-PCM029			SD-PCM030			SD-PCM031			SD-PCM032			SD-PCM033			SD-PCM034			SD-PCM035			SD-PCM036		
		Monitoring Year	Year 0 (2015)			Year 0 (2015)			Year 0 (2015)			Year 0 (2015)			Year 0 (2015)			Year 0 (2015)			Year 0 (2015)			Year 0 (2015)			Year 0 (2015)			Year 0 (2015)			Year 0 (2015)			Year 0 (2015)		
		Collection Date	3/11/2015			3/10/2015			2/25/2015			2/24/2015			2/24/2015			2/25/2015			3/12/2015			3/12/2015			3/12/2015			3/12/2015			3/12/2015			3/12/2015		
		Sample Depth (ft)	0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33		
		Sample ID	SD-PCM02515			SD-PCM02615			SD-PCM02715			SD-PCM02815			SD-PCM02915			SD-PCM03015			SD-PCM03115			SD-PCM03215			SD-PCM03315			SD-PCM03415			SD-PCM03515			SD-PCM03615		
Analyte	**SMS SQS Criteria [3]**		**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**
Phthalate Esters (µg/kg)																																				
Dimethyl phthalate	71		4.7	U		3.1	J		4.8	U		4.6	U		4.7	U		4.9	U		4.8	U		5	U		4.6	U		5	U		4.7	U		4.6	U	
Diethyl phthalate	200		19	U		20	U		76	B	U	19			19	U		29	B	U	19	U		20	U		18	U		20	U		19	U		19	U	
Di-n-butyl phthalate	1,400		19	U		20	U		19	U		19	U		19	U		20	U		19	U		20	U		18	U		20	U		19	U		19	U	
Butyl benzyl phthalate	63		4.7	U		3.7	J	J	4.8	U		4.6	U		4.7	U		4.9	U		4.8	U		39	Q	J	4.6	U		5	U		4.7	U		4.6	U	
Bis[2-ethylhexyl] phthalate	1,300		47	U		49	U		48	U		46	U		47	U		29	J		48	U		410			46	U		50	U		47	U		46	U	
Di-n-octyl phthalate	6,200		19	U		20	U		19	U		19	U		19	U		20	U		19	U		40			18	U		20	U		19	U		19	U	
Miscellaneous (µg/kg)																																				
Dibenzofuran	540		19	U		20	U		19	U		19	U		19	U		20	U		19	U		20	U		18	U		20	U		5.6	J		19	U	
Hexachlorobutadiene	11		4.7	U		3	J		4.8	U		4.6	U		4.7	U		4.9	U		4.8	U		5	U		4.6	U		5	U		4.7	U		4.6	U	
N-nitrosodiphenylamine	28		4.7	U		4.9	U		4.8	U		4.6	U		4.7	U		4.9	U		4.8	U		5	U		4.6	U		5	U		4.7	U		4.6	U	
Ionizable Organic Compounds (µg/kg)																																				
Phenol	420		19	U	UJ	9.8	J		19	U		19	U		19	U	UJ	20	U		63			570			18	U		20	U		19	U		19	U	
2-Methylphenol	63		4.7	U	UJ	4.9	U		4.8	U		4.6	U		4.7	U	UJ	4.9	U		12	M	N	5	U		4.6	U		5	U		4.7	U		4.6	U	
4-Methylphenol	670		19	U	UJ	20	U		19	U		19	U		19	U	UJ	20	U		98			130			18	U		20	U		19			19	U	
2,4-Dimethylphenol	29		23	U	UJ	25	U		24	U		23	U		24	U	UJ	25	U		24	U		25	U		23	U		25	U		23	U		23	U	
Pentachlorophenol	360		19	U	UJ	20	U		19	U		19	U		19	U	UJ	20	U		19	U	UJ	18	J	J	18	U	UJ	20	U		19	U	UJ	19	U	UJ
Benzyl alcohol	57		19	U	UJ	20	U		19	U		19	U		19	U		15	J		56			360			19	U		20	U		28			19	U	
Benzoic acid	650		190	U	UJ	200	U		190	U		190	U		190	U	UJ	200	U		680	Q	J	2600	Q	J	180	U		200	U		84	JQ	J	190	U	
PCBs (µg/kg)																																				
Aroclor 1016	NE		3.7	U		3.9	U		3.8	U		3.8	U		3.8	U		3.9	U		4	U		4	U		3.9	U		4	U		3.8	U		3.8	U	
Aroclor 1221	NE		3.7	U		3.9	U		3.8	U		3.8	U		3.8	U		3.9	U		4	U		4	U		3.9	U		4	U		3.8	U		3.8	U	
Aroclor 1232	NE		3.7	U		3.9	U		3.8	U		3.8	U		3.8	U		3.9	U		4	U		4	U		3.9	U		4	U		3.8	U		3.8	U	
Aroclor 1242	NE		3.7	U		3.9	U		3.8	U		3.8	U		3.8	U		3.9	U		4	U		4	U		3.9	U		4	U		3.8	U		3.8	U	
Aroclor 1248	NE		3.7	U		3.9	U		3.8	U		3.8	U		3.8	U		3.9	U		4	U		40	Y	UY	3.9	U		4	U		3.8	U		3.8	U	
Aroclor 1254	NE		3.7	U		3.9	U		3.8	U		3.8	U		3.8	U		3.9	U		9.9	Y	UY	68			3.9	U		9.9	Y	UY	9.4	Y	UY	9.5	Y	UY
Aroclor 1260	NE		3.7	U		3.9	U		3.8	U		3.8	U		3.8	U		3.9	U		4	U		53	P	J	3.9	U		3.7	J		4.8			3.8	U	
Total PCBs (µg/kg Dry-Weight)	130		3.7	U		3.9	U		3.8	U		3.8	U		3.8	U		3.9	U		9.9	Y		121	P	J [5]	3.9	U		3.7	J	J [5]	4.8			9.5	Y	
Total PCBs (mg/kg OC) [4]	12		—			—			—			—			—			—			0.4			—			—			0.3		J [6]	0.3			1.0		

Note(s)

1. Laboratory data flags (Q1) are as follows:
   U = analyte not detected at the reporting limit provided.
   J = estimated concentration when the value is less than the RL.
   Q = detected analyte with an initial or continuing calibration that does not meet established acceptance criteria.
   Y = analyte not detected at the reporting limit provided. The reporting limit is raised due to chromatographic interferences.
   P = Analyte detected on both chromatographic columns; RPD >40% with no chromatographic interference.
   B = analyte detected in associated method blank at concentration greater than 1/2 RL, or 5% analyte concentration.
   M = estimated value for analyte detected with poor spectral match.
2. Validation qualifiers (Q2) are defined as follows:
   J = analyte positively identified; value is approximate concentration in sample.
   N = The analysis indicates the presence of an analyte for which there is presumptive evidence to make a tentative identification.
   U = material was analyzed for, but was not detected above the level of the associated value.
   UJ = material was not detected; reporting limit is estimated and may be inaccurate or imprecise.
   UY = material was not detected; raised reporting limit.
3. Criteria obtained from Table 3 of Construction and Post-Construction Sediment Monitoring QAPP (AMEC et al. 2012).
4. — = no carbon-normalized value was calculated when results for organic carbon were outside the normal carbon normalization range of 0.5 to 4.0%.
5. If 20% of total detected Aroclors are qualified as estimated, the total calculated PCB concentration will also be considered estimated and assigned a "J" qualifier.
6. If the total calculated PCB concentration is considered to be estimated and assigned a "J" qualifier, then the organic carbon normalized value will also be assigned a "J" qualifier.

Abbreviation(s)

ft = feet
HPAHs = high-molecular-weight polycyclic aromatic hydrocarbons
LPAHs = low-molecular-weight polycyclic aromatic hydrocarbons
mg/kg = milligrams per kilogram
mg/kg OC = milligrams per kilogram organic carbon
MLLW = mean lower low water
NE = not established
PCBs = polychlorinated biphenyls
Q1 = laboratory qualifiers
Q2 = validation qualifiers
QAPP = Quality Assurance Project Plan
RL = reporting limit
RPD = relative percent difference
SMS SQS = Washington Sediment Management Standards Sediment Quality Standards (173-204-320 WAC)
µg/kg = micrograms per kilogram
µg/kg Dry-Weight = micrograms per kilogram dry weight
WAC = Washington Administrative Code

TABLE 3

DIOXINS AND FURANS ANALYTICAL RESULTS[1, 2]
Post-Construction Surface Sediment Monitoring—Year 0
Duwamish Sediment Other Area and Southwest Bank
Corrective Measure and Habitat Project
Boeing Plant 2
Seattle/Tukwila, Washington

		In-water Work Area Samples Above -5 ft MLLW and Below +4 ft MLLW									In-water Dredging Area Samples Below -5 ft MLLW								
Sampling Area																			
Location		SD-PCM001			SD-PCM004			SD-PCM008			SD-PCM010			SD-PCM015			SD-PCM019		
Monitoring Year		Year 0 (2015)			Year 0 (2015)			Year 0 (2015)			Year 0 (2015)			Year 0 (2015)			Year 0 (2015)		
Collection Date		3/11/2015			3/11/2015			2/24/2015			3/11/2015			3/11/2015			2/24/2015		
Sample Depth (ft)		0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33			0 - 0.33		
Sample ID		SD-PCM00115			SD-PCM00415			SD-PCM00815			SD-PCM01015			SD-PCM01515			SD-PCM01915		
Analyte		**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**
Dioxins and Furans (ng/kg)	**TEF [3]**																		
2,3,7,8-TCDD	1	0.131	JEMPC		0.134	JEMPC		0.0252	U		0.164	JEMPC		0.0299	U		0.124	JEMPC	
2,3,7,8-TCDF	0.1	0.0438	U		0.0579	U		0.031	U		0.0818	J		0.0539	JEMPC		0.0415	U	
1,2,3,7,8-PeCDD	1	0.0597	JEMPC		0.03	U		0.0329	U		0.0439	U		0.0359	U		0.0592	JEMPC	
1,2,3,7,8-PeCDF	0.03	0.133	JEMPC		0.292	JEMPC		0.0717	BJEMPC	J	0.134	J		0.176	J		0.118	BJEMPC	J
2,3,4,7,8-PeCDF	0.3	0.0537	U		0.158	BJEMPC	U	0.0349	U		0.0658	BJEMPC	U	0.0778	BJ	U	0.0395	U	
1,2,3,4,7,8-HxCDD	0.1	0.0498	JEMPC		0.0579	J		0.031	U		0.0658	JEMPC		0.0299	U		0.0415	U	
1,2,3,6,7,8-HxCDD	0.1	0.0557	U		0.0699	BJEMPC	U	0.0329	U		0.201	BJEMPC	U	0.0559	BJ	U	0.101	BJEMPC	U
1,2,3,7,8,9-HxCDD	0.1	0.0995	JEMPC		0.0639	JEMPC		0.0388	JEMPC		0.104	JEMPC		0.0379	JEMPC		0.109	JEMPC	
1,2,3,4,7,8-HxCDF	0.1	0.0896	BJ	J	0.124	BJEMPC	J	0.0349	U		0.156	BJEMPC	J	0.136	BJEMPC	J	0.0533	BJEMPC	J
1,2,3,6,7,8-HxCDF	0.1	0.145	BJEMPC	U	0.218	BJEMPC	U	0.0329	BJEMPC	U	0.138	BJEMPC	U	0.176	BJ	U	0.0987	BJEMPC	U
1,2,3,7,8,9-HxCDF	0.1	0.117	BJ	U	0.164	BJEMPC	U	0.0659	BJEMPC	U	0.144	BJEMPC	U	0.144	BJ	U	0.101	BJEMPC	U
2,3,4,6,7,8-HxCDF	0.1	0.0637	BJEMPC	J	0.108	BJ	J	0.0368	BJEMPC	J	0.0598	BJEMPC	J	0.128	BJEMPC	J	0.0454	U	
1,2,3,4,6,7,8-HpCDD	0.01	1.14	B	J	0.865	BJ	J	0.587	BJEMPC	U	4.69	B		0.862	BJ	J	1.73	B	U
1,2,3,4,6,7,8-HpCDF	0.01	0.129	BJEMPC	U	0.246	BJEMPC	U	0.095	BJEMPC	J	0.816	JEMPC		0.228	BJ	U	0.193	BJ	J
1,2,3,4,7,8,9-HpCDF	0.01	0.0438	J		0.0759	J		0.031	U		0.116	JEMPC		0.0579	JEMPC		0.0336	U	
OCDD	0.0003	8.77	B	U	5.46	B	U	3.76	B	U	31.8	B	J	6.47	B	U	9.62	B	U
OCDF	0.0003	0.392	J		0.25	J		0.0523	U		1.84	J		0.571	J		0.075	U	
Total HpCDD		3.17		J	2.42		J	1.48	EMPC	U	12.6			2		J	5.08		U
Total HpCDF		0.356	EMPC	J	0.626	EMPC	J	0.179	EMPC	J	2.58	EMPC		0.808	EMPC		0.259	EMPC	J
Total HxCDD		1.1	EMPC	J	1.06	EMPC	J	0.469	EMPC	J	2.55	EMPC		0.414	EMPC	J	1.9	EMPC	J
Total HxCDF		0.912	EMPC	J	2.07	EMPC	J	0.39	EMPC	J	1.97	EMPC	J	1.5	EMPC	J	0.7	EMPC	J
Total PeCDD		0.199	EMPC		0.126	EMPC		0.0329	U		0.448	EMPC		0.0403	EMPC		0.421	EMPC	
Total PeCDF		1.19	EMPC	J	2.9	EMPC	J	0.333	EMPC	J	1.89	EMPC	J	2.17	EMPC	J	0.889	EMPC	J
Total TCDD		0.972	EMPC		0.436	EMPC		0.565			0.746	EMPC		0.348	EMPC		0.64	EMPC	
Total TCDF		1.5	EMPC	J	2.57	EMPC	J	0.303	EMPC	J	2	EMPC	J	1.87	EMPC	J	0.896	EMPC	J
WHO 2005 [3] TEQ (ND = 0 including EMPC)		0.27			0.28			0.03			0.35			0.12			0.26		
WHO 2005 [3] TEQ (ND = 1/2 EDL including EMPC)		0.28			0.3			0.07			0.37			0.15			0.27		

Note(s)

1. Laboratory data flags (Q1) are as follows:
   U = analyte not detected at the reporting limit provided.
   B = analyte detected in an associated method blank at a concentration greater than 1/2 the RL or 5% of the analyte concentration in the sample.
   EMPC = value calculated for 2,3,7,8-substituted isomers for which the quantitation and/or confirmation ion(s) has signal to noise in excess of 2.5, but does not meet identification criteria.
   J = estimated concentration when the value is less than the RL.
2. Validation qualifiers (Q2) are defined as follows:
   J = analyte positively identified; value is approximate concentration in sample.
   U = material was analyzed for, but was not detected above the level of the associated value.
3. Source: Van den Berg et al. 2006.

Abbreviation(s)

EDL = estimated detection limit
EMPC = estimated maximum possible concentration
ft = feet
MLLW = mean lower low water
ND = non detected
ng/kg = nanograms per kilogram
Q1 = laboratory qualifiers
Q2 = validation qualifiers
RL = reporting limit
TEF = toxicity equivalency factors
TEQ = toxic equivalency quotient

TABLE 4

GRAIN-SIZE ANALYSIS RESULTS

Post-Construction Surface Sediment Monitoring—Year 0
Duwamish Sediment Other Area and Southwest Bank
Corrective Measure and Habitat Project
Boeing Plant 2
Seattle/Tukwila, Washington

Sampling Area	In-water Work Area Samples Above -5 ft MLLW and Below +4 ft MLLW									In-water Dredging Area Samples Below -5 ft MLLW								
Location	**SD-PCM002**			**SD-PCM005**			**SD-PCM007**			**SD-PCM011**			**SD-PCM014**			**SD-PCM018**		
Monitoring Year	**Year 0 (2015)**			**Year 0 (2015)**			**Year 0 (2015)**			**Year 0 (2015)**			**Year 0 (2015)**			**Year 0 (2015)**		
Collection Date	**3/10/2015**			**3/10/2015**			**2/24/2015**			**3/10/2015**			**3/10/2015**			**2/24/2015**		
Sample Depth (ft)	**0 - 0.33**			**0 - 0.33**			**0 - 0.33**			**0 - 0.33**			**0 - 0.33**			**0 - 0.33**		
Sample ID	**SD-PCM00215**			**SD-PCM00515**			**SD-PCM00715**			**SD-PCM01115**			**SD-PCM01415**			**SD-PCM01815**		
Analyte	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**	**Value**	**Q1**	**Q2**
Grain Size (%)																		
Gravel	26.7			27.5			25.8			28			17.6			22.9		
Very Coarse Sand	26.6			24.7			25.6			28			25.2			23.6		
Coarse Sand	26.8			27.4			25.1			26.3			34.8			28.2		
Medium Sand	14.6			16			17.7			14.5			19.4			19.8		
Fine Sand	2.5			2.6			3.0			2.3			2.4			3.4		
Very Fine Sand	0.4			0.5			0.3			0.4			0.4			0.7		
Coarse Silt	2.3	U		1.1	U		2.4	U		0.5	U		0.2	U		1.4	U	
Medium Silt	2.3	U		1.1	U		2.4	U		0.5	U		0.2	U		1.4	U	
Fine Silt	2.3	U		1.1	U		2.4	U		0.5	U		0.2	U		1.4	U	
Very Fine Silt	2.3	U		1.1	U		2.4	U		0.5	U		0.2	U		1.4	U	
8-9 Phi Clay	2.3	U		1.1	U		2.4	U		0.5	U		0.2	U		1.4	U	
9-10 Phi Clay	2.3	U		1.1	U		2.4	U		0.5	U		0.2	U		1.4	U	
> 10 Phi Clay	2.3	U		1.1	U		2.4	U		0.5	U		0.2	U		1.4	U	
Total Fines	2.3			1.1			2.4			0.5			0.2			1.4		

Note(s)
1. Laboratory data flags (Q1) are as follows:
   U = analyte not detected at the reporting limit provided.
2. No validation qualifiers (Q2) assigned.

Abbreviation(s)
ft = feet
MLLW = mean lower low water
Q1 = laboratory qualifiers
Q2 = validation qualifiers

TABLE 5

FREQUENCY OF DETECTION OF CHEMICAL ANALYTES
Post-Construction Surface Sediment Monitoring—Year 0
Duwamish Sediment Other Area and Southwest Bank
Corrective Measure and Habitat Project
Boeing Plant 2
Seattle/Tukwila, Washington

Analyte	SMS SQS Criteria	Number of Analyses	Number of Detections	Minimum Detected Value	Maximum Detected Value
Conventionals					
Total Organic Carbon (percent)	–	40	40	0.034	8.7
Metals (mg/kg)					
Arsenic	57	40	40	1.2	15
Cadmium	5.1	40	22	0.2	0.5
Chromium	260	40	40	13.2	34.5
Copper	390	40	40	11.1	50
Lead	450	40	9	2	20
Mercury	0.41	40	6	0.02	0.1
Silver	6.1	40	0	–	–
Zinc	410	40	40	25	138
Non-ionizable Organic Compounds					
Aromatic Hydrocarbons (µg/kg)					
Total LPAHs					
Naphthalene	2100	40	2	12	56
Acenaphthylene	1300	40	0	–	–
Acenaphthene	500	40	2	5.6	17
Fluorene	540	40	2	7.5	18
Phenanthrene	1500	40	7	11	130
Anthracene	960	40	3	5.8	110
2-Methylnaphthalene	670	40	1	6.7	6.7
Total HPAHs					
Fluoranthene	1700	40	9	4.8	140
Pyrene	2600	40	8	6.8	130
Benz[a]anthracene	1300	40	3	7.8	40
Chrysene	1400	40	5	7.5	110
Total benzofluoranthenes	3200	40	5	10	130
Benzo[a]pyrene	1600	40	3	6.9	37
Indeno[1,2,3-c,d]pyrene	600	40	3	6.5	29
Dibenzo[a,h]anthracene	230	40	8	2.5	13
Benzo[g,h,i]perylene	670	40	5	12	39
Chlorinated Benzenes (µg/kg)					
1,2-Dichlorobenzene	35	40	4	2.8	3.5
1,4-Dichlorobenzene	110	40	3	2.5	3.4
1,2,4-Trichlorobenzene	31	40	3	2.6	3.5
Hexachlorobenzene	22	40	3	3.2	3.8
Phthalate Esters (µg/kg)					
Dimethyl phthalate	71	40	2	2.7	3.1
Diethyl phthalate	200	40	5	19	76
Di-n-butyl phthalate	1400	40	0	–	–
Butyl benzyl phthalate	63	40	12	2.5	59
Bis[2-ethylhexyl] phthalate	1300	40	4	29	410
Di-n-octyl phthalate	6200	40	1	40	40
Miscellaneous (µg/kg)					
Dibenzofuran	540	40	1	5.6	5.6
Hexachlorobutadiene	11	40	3	2.4	3
N-nitrosodiphenylamine	28	40	0	–	–

TABLE 5

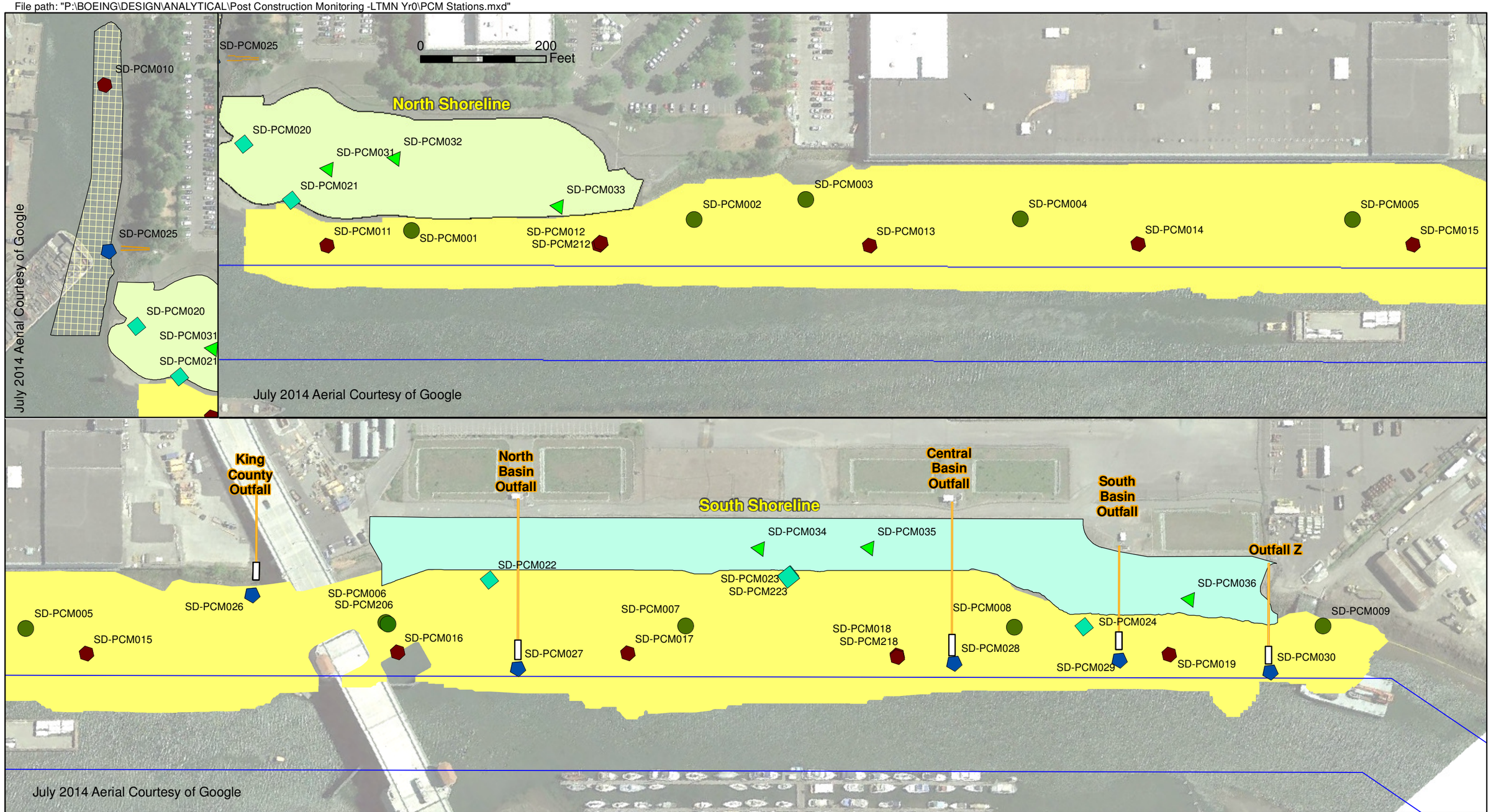
FREQUENCY OF DETECTION OF CHEMICAL ANALYTES
Post-Construction Surface Sediment Monitoring—Year 0
Duwamish Sediment Other Area and Southwest Bank
Corrective Measure and Habitat Project
Boeing Plant 2
Seattle/Tukwila, Washington

Analyte	SMS SQS Criteria	Number of Analyses	Number of Detections	Minimum Detected Value	Maximum Detected Value
Ionizable Organic Compounds (µg/kg)					
Phenol	420	40	11	8.9	570
2-Methylphenol	63	40	1	12	12
4-Methylphenol	670	40	4	19	130
2,4-Dimethylphenol	29	40	0	–	–
Pentachlorophenol	360	40	2	13	18
Benzyl alcohol	57	40	3	28	360
Benzoic acid	650	40	6	62	2600
PCBs (µg/kg)					
Aroclor 1016	–	40	0	–	–
Aroclor 1221	–	40	0	–	–
Aroclor 1232	–	40	0	–	–
Aroclor 1242	–	40	0	–	–
Aroclor 1248	–	40	0	–	–
Aroclor 1254	–	40	3	5.2	68
Aroclor 1260	–	40	5	3.6	53
Dioxins and Furans (pg/kg)					
2,3,7,8-TCDD	–	6	0	–	–
2,3,7,8-TCDF	–	6	1	0.0818	0.0818
1,2,3,7,8-PeCDD	–	6	0	–	–
1,2,3,7,8-PeCDF	–	6	2	0.134	0.176
2,3,4,7,8-PeCDF	–	6	1	0.0778	0.0778
1,2,3,4,7,8-HxCDD	–	6	1	0.0579	0.0579
1,2,3,6,7,8-HxCDD	–	6	1	0.0559	0.0559
1,2,3,7,8,9-HxCDD	–	6	0	–	–
1,2,3,4,7,8-HxCDF	–	6	1	0.0896	0.0896
1,2,3,6,7,8-HxCDF	–	6	1	0.176	0.0176
1,2,3,7,8,9-HxCDF	–	6	2	0.117	0.144
2,3,4,6,7,8-HxCDF	–	6	1	0.108	0.108
1,2,3,4,6,7,8-HpCDD	–	6	5	0.862	4.69
1,2,3,4,6,7,8-HpCDF	–	6	2	0.193	0.228
1,2,3,4,7,8,9-HpCDF	–	6	2	0.0438	0.0759
OCDD	–	6	6	3.76	31.8
OCDF	–	6	4	0.25	1.84
Total HpCDD	–	6	5	2	12.6
Total HpCDF	–	6	0	–	–
Total HxCDD	–	6	0	–	–
Total HxCDF	–	6	0	–	–
Total PeCDD	–	6	0	–	–
Total PeCDF	–	6	0	–	–
Total TCDD	–	6	1	0.565	0.565
Total TCDF	–	6	0	–	–

Abbreviation(s)
HPAHs = high-molecular-weight polycyclic aromatic hydrocarbons
LPAHs = low-molecular-weight polycyclic aromatic hydrocarbons
mg/kg = milligrams per kilogram
PCBs = polychlorinated biphenyls
pg/kg = picograms per kilogram
SMS SQS = Washington Sediment Management Standards Sediment Quality Standards (173-204-320 WAC)
µg/kg = micrograms per kilogram
WAC = Washington Administrative Code

FIGURE

File path: "P:\BOEING\DESIGN\ANALYTICAL\Post Construction Monitoring -LTMN Yr0\PCM Stations.mxd"



Legend

- Shoreline Area Samples (at approximately +7 ft MLLW)
- Shoreline Area Samples (at approximately +4 ft MLLW)
- Sampling Locations (above -5 ft MLLW and below + 4 ft MLLW)
- Sampling Location (below -5 ft MLLW)
- Outfall Sample Locations
- North Shoreline Area
- South Shoreline Area
- Slip 4 Approximate Dredge Area
- DSOA Limits of Dredging

BOEING

POST-CONSTRUCTION SURFACE MONITORING
SAMPLING LOCATIONS
Post-Construction Surface Sediment Monitoring — Year 0
Duwamish Sediment Other Area and Southwest
Bank Corrective Measure and Habitat Project,
Boeing Plant 2, Seattle/Tukwila, Washington

By: RHG	Date:08/14/2015	Project No. 0131320090
		Figure 1

ATTACHMENT A

Qualitative Sample Characteristics Forms and Photographs

ATTACHMENT A

Qualitative Sample Characteristics Forms and Photographs

QUALITATIVE SAMPLE CHARACTERISTICS

Page ___ of ___

Coordinate Datum	Date (mm/dd/yy)	Project Location	Sample Identification Number
WA State Plane, N Zone, NAD 83, Survey Ft	3-11-15	Boeing PL2	SD-PCM001 15

Coordinates		Water Depth					Time
North	East	Depth	Unit f	Unit t	Rep	Gear	
198117	1273101	11.2	f	t	1	0.2 Grab	1009

Penetration Depth	Penetration Unit	Initials	Sulfide	VOA	Weather	Fines (%)
8	c m	CSM			cloudy	

Surficial Wood Estimate:

Contact Points _____ X 5 = _____ %

Surficial sediment characteristics:

Biological: 0 % **Debris:** 0 % **Oil Sheen:** (None) Trace (<5%) _____ %

Moisture
Very Wet (Wet) Moist Damp Dry

Color (Circle major & underline modifying)
Light (Medium) Dark Olive Gray (Brown) Black Other _____

Major Constituent (Circle major & underline modifying)
Fine (Medium) Coarse Gravel (Sand) Silt Clay _____

Minor Constituent with trace
Fine Medium (Coarse) Gravel (Sand) Silt Clay _____

Subsurface sediment characteristics:

Density / Consistency

Sand / Gravel - Very Loose (Loose) Medium Dense Dense Very Dense

Silt / Clay - Very Soft Soft Medium Stiff Stiff Very Stiff Hard

Moisture
Very Wet (Wet) Moist Damp Dry

Color (Circle major & underline modifying)
Light (Medium) Dark Olive Gray (Brown) Black Other _____

Major Constituent (Circle major & underline modifying)
Fine (Medium) Coarse Gravel (Sand) Silt Clay _____

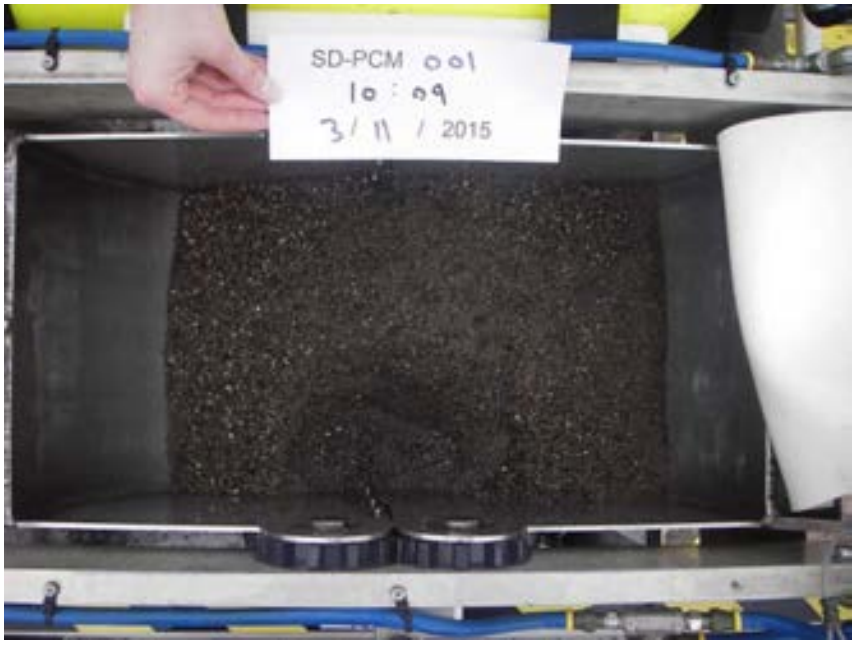
Minor Constituent with trace
Fine Medium (Coarse) Gravel (Sand) Silt Clay _____

Biological: 0 % **Debris:** 0 % **Oil Sheen:** (None) Trace (<5%) _____ %

Comments:

AmecFW Proj. BP2 PCM
SD-PCM00115 Initials: CSM
QSC Form
Date: 3 / 11 /2015 Time: 1009

AmniField Forms/QSC



Station SD-PCM001

QUALITATIVE SAMPLE CHARACTERISTICS

Page ____ of ____

Coordinate Datum	Date (mm/dd/yy)	Project Location	Sample Identification Number
WA State Plane, N Zone, NAD 83, Survey Ft	3-10-15	Boeing PL2	SD-PCM 002 15

Coordinates		Water Depth					Time
North	East	Depth	Unit	Rep	Gear		
197828	1273448	9.0	f t	1	0.2 Grab		1323

Penetration							Fines (%)
Depth	Unit	Initials	Sulfide	VOA	Weather		
17	c m	GSM			9 cloudy		

Surficial Wood Estimate:

Contact Points _____ X 5 = _____ %

Surficial sediment characteristics:

Biological: 0 % **Debris:** 0 % **Oil Sheen:** (None) Trace (<5%) _____ %

Moisture
Very Wet (Wet) Moist Damp Dry

Color (Circle major & underline modifying)
Light (Medium) Dark Olive Gray (Brown) Black Other _____

Major Constituent (Circle major & underline modifying)
Fine (Medium) Coarse Gravel (Sand) Silt Clay _____

Minor Constituent with trace
(Fine) Medium Coarse Gravel Sand (Silt) Clay _____

Subsurface sediment characteristics:

Density / Consistency

Sand / Gravel - Very Loose (Loose) Medium Dense Dense Very Dense

Silt / Clay - Very Soft Soft Medium Stiff Stiff Very Stiff Hard

Moisture
Very Wet (Wet) Moist Damp Dry

Color (Circle major & underline modifying)
Light (Medium) Dark Olive Gray (Brown) Black Other _____

Major Constituent (Circle major & underline modifying)
Fine (Medium) Coarse Gravel (Sand) Silt Clay _____

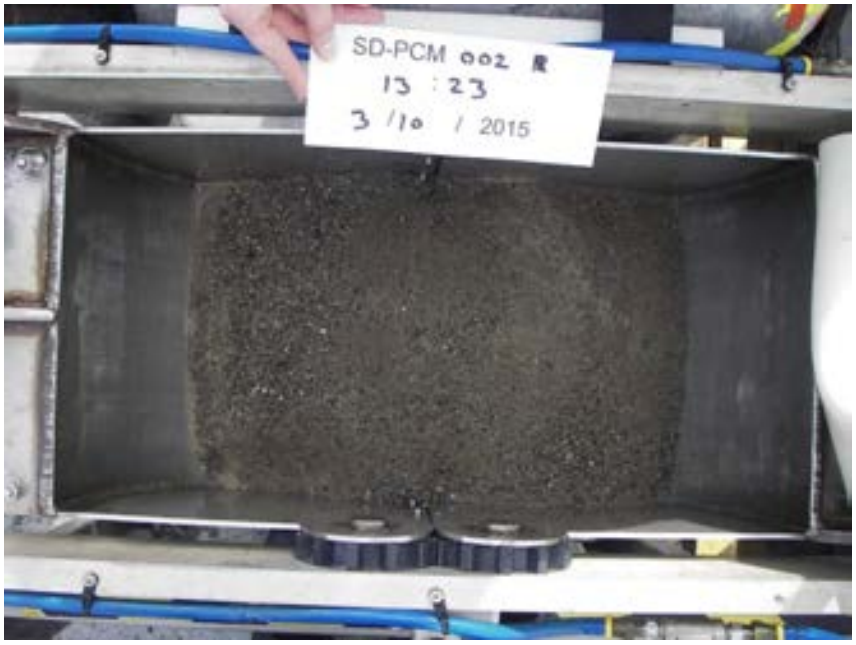
Minor Constituent with trace
Fine Medium Coarse Gravel Sand Silt Clay _____

Biological: 0 % **Debris:** 0 % **Oil Sheen:** (None) Trace (<5%) _____ %

Comments:
Medium brown and light brown silt on top layer

AmecFW Proj. BP2 PCM
SD-PCM00215 Initials: GSM
QSC Form
Date: 3/10/2015 Time: 1323

AmecField Forms\QSC



Station SD-PCM002

QUALITATIVE SAMPLE CHARACTERISTICS

Page ___ of ___

Coordinate Datum	Date (mm/dd/yy)	Project Location	Sample Identification Number
WA State Plane, N Zone, NAD 83, Survey Ft	3-11-15	Boeing PL2	SD-PCM 003 15

Coordinates		Water Depth				Time
North	East	Depth	Unit	Rep	Gear	
197733	1273602	9.8	f t	1	0.2 Grab	925

Penetration						
Depth	Unit	Initials	Sulfide	VOA	Weather	Fines (%)
14	c m	GSM			cloudy	

Surficial Wood Estimate:

Contact Points _____ X 5 = _____ %

Surficial sediment characteristics:

Biological: 0 % **Debris:** 0 % **Oil Sheen:** None Trace (<5%) _____ %

Moisture
Very Wet Wet Moist Damp Dry

Color (Circle major & underline modifying)
Light Medium Dark Olive Gray Brown Black Other _____

Major Constituent (Circle major & underline modifying)
Fine Medium Coarse Gravel Sand Silt Clay _____

Minor Constituent with trace
Fine Medium Coarse Gravel Sand Silt Clay _____

Subsurface sediment characteristics:

Density / Consistency

Sand / Gravel - Very Loose Loose Medium Dense Dense Very Dense

Silt / Clay - Very Soft Soft Medium Stiff Stiff Very Stiff Hard

Moisture
Very Wet Wet Moist Damp Dry

Color (Circle major & underline modifying)
Light Medium Dark Olive Gray Brown Black Other _____

Major Constituent (Circle major & underline modifying)
Fine Medium Coarse Gravel Sand Silt Clay _____

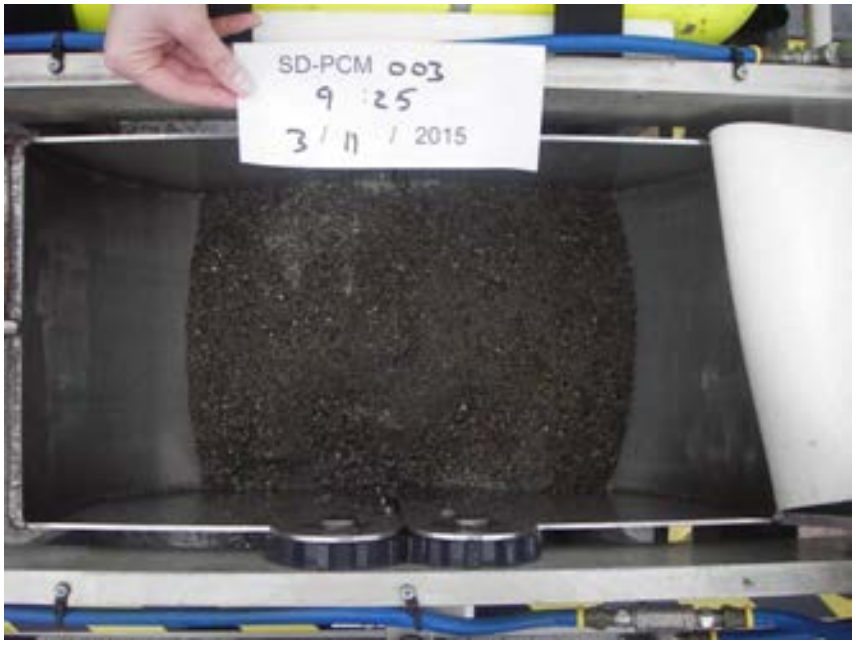
Minor Constituent with trace
Fine Medium Coarse Gravel Sand Silt Clay _____

Biological: 0 % **Debris:** 0 % **Oil Sheen:** None Trace (<5%) _____ %

Comments:
trace fine, light brown silt ontop layer

AmecFW Proj. BP2 PCM
SD-PCM00315 Initials: GSM
QSC Form
Date: 3 / 11 /2015 Time: 925

Amin\Field Forms\QSC



Station SD-PCM003

QUALITATIVE SAMPLE CHARACTERISTICS

Page ___ of ___

Coordinate Datum	Date (mm/dd/yy)	Project Location	Sample Identification Number
WA State Plane, N Zone, NAD 83, Survey Ft	3-11-15	Boeing PL2	SD-PCM 004 15

Coordinates		Water Depth				Time
North	East	Depth	Unit	Rep	Gear	
197481	1273835	11.4	f t	1	0.2 Grab	910

Penetration Depth	Penetration Unit	Initials	Sulfide	VOA	Weather	Fines (%)
12	c m	GSM			Rain	

Surficial Wood Estimate:

Contact Points _____ X 5 = _____ %

Surficial sediment characteristics:

Biological: 0 % **Debris:** 0 % **Oil Sheen:** None Trace (<5%) _____ %

Moisture
Very Wet Wet Moist Damp Dry

Color (Circle major & underline modifying)
Light Medium Dark Olive Gray Brown Black Other _____

Major Constituent (Circle major & underline modifying)
Fine Medium Coarse Gravel Sand Silt Clay _____

Minor Constituent with trace
Fine Medium Coarse Gravel Sand Silt Clay _____

Subsurface sediment characteristics:

Density / Consistency

Sand / Gravel - Very Loose Loose Medium Dense Dense Very Dense

Silt / Clay - Very Soft Soft Medium Stiff Stiff Very Stiff Hard

Moisture
Very Wet Wet Moist Damp Dry

Color (Circle major & underline modifying)
Light Medium Dark Olive Gray Brown Black Other _____

Major Constituent (Circle major & underline modifying)
Fine Medium Coarse Gravel Sand Silt Clay _____

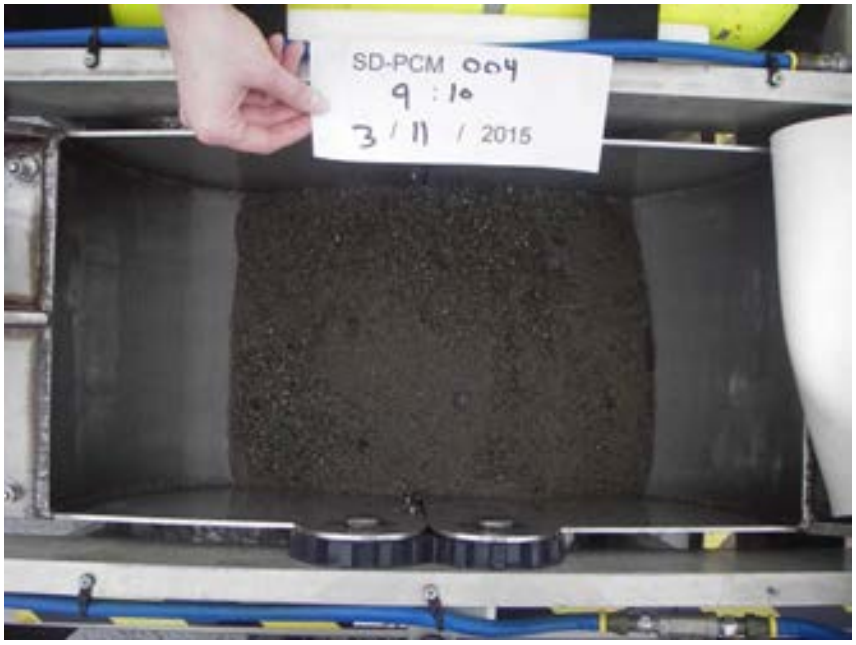
Minor Constituent with trace
Fine Medium Coarse Gravel Sand Silt Clay _____

Biological: 0 % **Debris:** 0 % **Oil Sheen:** None Trace (<5%) _____ %

Comments:

AmecFW Proj. BP2 PCM
SD-PCM00415 Initials: GSM
QSC Form
Date: 3/11/2015 Time: 910

AmecFW, 3500 188th St. SW, Suite 601, Lynnwood, WA 98037, (425) 921-4000



Station SD-PCM004

QUALITATIVE SAMPLE CHARACTERISTICS

Page ___ of ___

Coordinate Datum	Date (mm/dd/yy)	Project Location	Sample Identification Number
WA State Plane, N Zone, NAD 83, Survey Ft	3-10-15	Boeing PL2	SD-PCM 005 15

Coordinates		Water Depth				Time
North	East	Depth	Unit	Rep	Gear	
1974228	1274228	5.2	f t	1	0.2 Grab	1246

Penetration						
Depth	Unit	Initials	Sulfide	VOA	Weather	Fines (%)
12	c m	CSR			sunny	

Surficial Wood Estimate:

Contact Points _____ X 5 = _____ %

Surficial sediment characteristics:

Biological: 0 % **Debris:** 0 % **Oil Sheen:** None Trace (<5%) _____ %

Moisture
Very Wet **Wet** Moist Damp Dry

Color (Circle major & underline modifying)
Light **Medium** Dark Olive Gray **Brown** Black Other _____

Major Constituent (Circle major & underline modifying)
Fine Medium Coarse Gravel Sand Silt Clay _____

Minor Constituent with trace
Fine **Medium** Coarse Gravel **Sand** Silt Clay _____

Subsurface sediment characteristics:

Density / Consistency

Sand / Gravel - Very Loose **Loose** Medium Dense Dense Very Dense

Silt / Clay - Very Soft Soft Medium Stiff Stiff Very Stiff Hard

Moisture
Very Wet **Wet** Moist Damp Dry

Color (Circle major & underline modifying)
Light **Medium** Dark Olive Gray **Brown** Black Other _____

Major Constituent (Circle major & underline modifying)
Fine **Medium** Coarse Gravel Sand Silt Clay _____

Minor Constituent with trace
Fine Medium Coarse Gravel **Sand** Silt Clay _____

Biological: 0 % **Debris:** 0 % **Oil Sheen:** None Trace (<5%) _____ %

Comments:

AmecFW Proj. BP2 PCM
SD-PCM00515 Initials: GSM
QSC Form
Date: 3/10/2015 Time: 1246

AmecFW/Field Forms/QSC

Station SD-PCM005

QUALITATIVE SAMPLE CHARACTERISTICS

Page ___ of ___

Coordinate Datum	Date (mm/dd/yy)	Project Location	Sample Identification Number
WA State Plane, N Zone, NAD 83, Survey Ft	3-10-15	Boeing PL2	SD-PCM 006 15

Coordinates		Water Depth				Time
19□□45 North	12□4□□2 East	Depth	Unit	Rep	Gear	
196749	1274661	10.7	f t	1	0.2 Grab	1022

Penetration Depth	Penetration Unit	Initials	Sulfide	VOA	Weather	Fines (%)
22	c m	GSM			Cloudy	

Surficial Wood Estimate:

Contact Points _____ X 5 = _____ %

Surficial sediment characteristics:

Biological: 0 % **Debris:** 0 % **Oil Sheen:** None Trace (<5%) _____ %

Moisture
Very Wet Wet Moist Damp Dry

Color (Circle major & underline modifying)
Light Medium Dark Olive Gray Brown Black Other trace light tan

Major Constituent (Circle major & underline modifying)
Fine Medium Coarse Gravel Sand Silt Clay

Minor Constituent with trace
Fine Medium Coarse Gravel Sand Silt Clay

Subsurface sediment characteristics:

Density / Consistency

Sand / Gravel - Very Loose Loose Medium Dense Dense Very Dense

Silt / Clay - Very Soft Soft Medium Stiff Stiff Very Stiff Hard

Moisture
Very Wet Wet Moist Damp Dry

Color (Circle major & underline modifying)
Light Medium Dark Olive Gray Brown Black Other

Major Constituent (Circle major & underline modifying)
Fine Medium Coarse Gravel Sand Silt Clay

Minor Constituent with trace
Fine Medium Coarse Gravel Sand Silt Clay

Biological: _____ % **Debris:** _____ % **Oil Sheen:** None Trace (<5%) _____ %

Comments:
trace light tan silt on surface

AmecFW Proj. BP2 PCM
SD-PCM00615 Initials: GSM
QSC Form
Date: 3 / 10 /2015 Time: 1022

Amn\Field Forms\QSC

Station SD-PCM006

QUALITATIVE SAMPLE CHARACTERISTICS

Page ___ of ___

Coordinate Datum	Date (mm/dd/yy)	Project Location	Sample Identification Number
WA State Plane, N Zone, NAD 83, Survey Ft	3-10-15	Boeing PL2	SD-PCM 206 15

Coordinates		Water Depth					Time
North	East	Depth	Unit		Rep	Gear	
196745	1274662	10.2	f	t	1	0.2 Grab	1036

Penetration							
Depth	Unit	Initials	Sulfide	VOA	Weather	Fines (%)	
18	c m	GJM			cloudy		

Surficial Wood Estimate:

Contact Points _____ X 5 = _____ %

Surficial sediment characteristics:

Biological: 0 % **Debris:** 0 % **Oil Sheen:** None Trace (<5%) _____ %

Moisture
Very Wet Wet Moist Damp Dry

Color (Circle major & underline modifying)
Light Medium Dark Olive Gray Brown Black Other _____

Major Constituent (Circle major & underline modifying)
Fine Medium Coarse Gravel Sand Silt Clay _____

Minor Constituent with trace
Fine Medium Coarse Gravel Sand Silt Clay _____

Subsurface sediment characteristics:

Density / Consistency

Sand / Gravel - Very Loose Loose Medium Dense Dense Very Dense

Silt / Clay - Very Soft Soft Medium Stiff Stiff Very Stiff Hard

Moisture
Very Wet Wet Moist Damp Dry

Color (Circle major & underline modifying)
Light Medium Dark Olive Gray Brown Black Other _____

Major Constituent (Circle major & underline modifying)
Fine Medium Coarse Gravel Sand Silt Clay _____

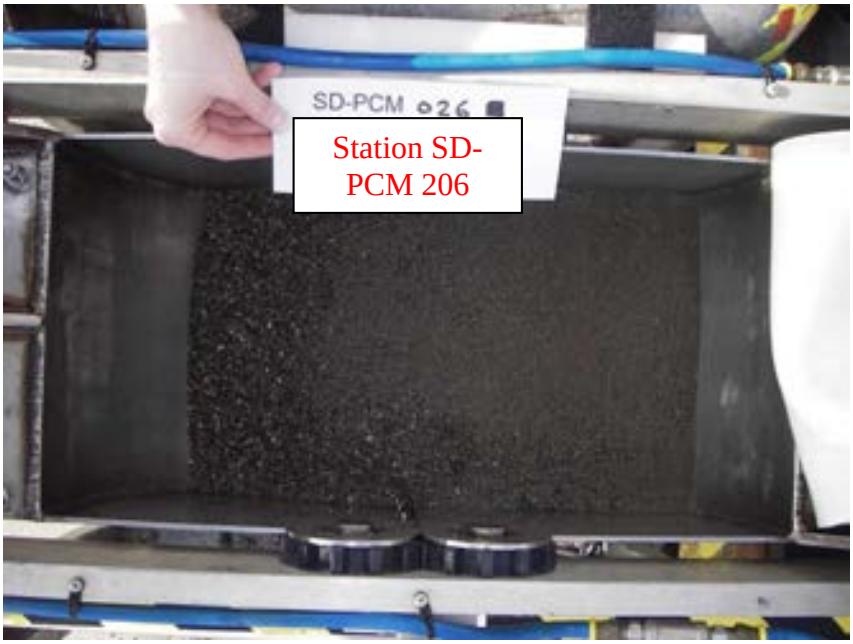
Minor Constituent with trace
Fine Medium Coarse Gravel Sand Silt Clay _____

Biological: 0 % **Debris:** 0 % **Oil Sheen:** None Trace (<5%) _____ %

Comments:
photo label woods 026

AmecFW Proj. BP2 PCM
SD-PCM20615 Initials: GJM
QSC Form
Date: 3/10/2015 Time: 1036

AmecFW, 3500 188th St. SW, Suite 601, Lynnwood, WA 98037, (425) 921-4000



Station SD-PCM206 (Duplicate of Station SD-PCM006)

QUALITATIVE SAMPLE CHARACTERISTICS

Page ___ of ___

Coordinate Datum	Date (mm/dd/yy)	Project Location	Sample Identification Number
WA State Plane, N Zone, NAD 83, Survey Ft	2-24-15	Boeing PL2	SD-PCM 07 15

Coordinates		Water Depth				Time
North	East	Depth	Unit	Rep	Gear	
196425	1275013	14.4	f t	1	0.2 Grab	942

Penetration						
Depth	Unit	Initials	Sulfide	VOA	Weather	Fines (%)
14	c m	BSM			Sunny	

Surficial Wood Estimate:

Contact Points _____ X 5 = _____ %

Surficial sediment characteristics:

Biological: 0 % **Debris:** 0 % **Oil Sheen:** (None) Trace (<5%) _____ %

Moisture
Very Wet (Wet) Moist Damp Dry

Color (Circle major & underline modifying)
Light (Medium) Dark Olive Gray (Brown) Black Other _____

Major Constituent (Circle major & underline modifying)
(Fine) Medium Coarse Gravel (Sand) Silt Clay _____

Minor Constituent with trace
Fine (Medium) Coarse Gravel (Sand) Silt Clay _____

Subsurface sediment characteristics:

Density / Consistency

Sand / Gravel - Very Loose (Loose) Medium Dense Dense Very Dense

Silt / Clay - Very Soft Soft Medium Stiff Stiff Very Stiff Hard

Moisture
Very Wet (Wet) Moist Damp Dry

Color (Circle major & underline modifying)
Light (Medium) Dark Olive Gray (Brown) Black Other _____

Major Constituent (Circle major & underline modifying)
Fine (Medium) Coarse Gravel (Sand) Silt Clay _____

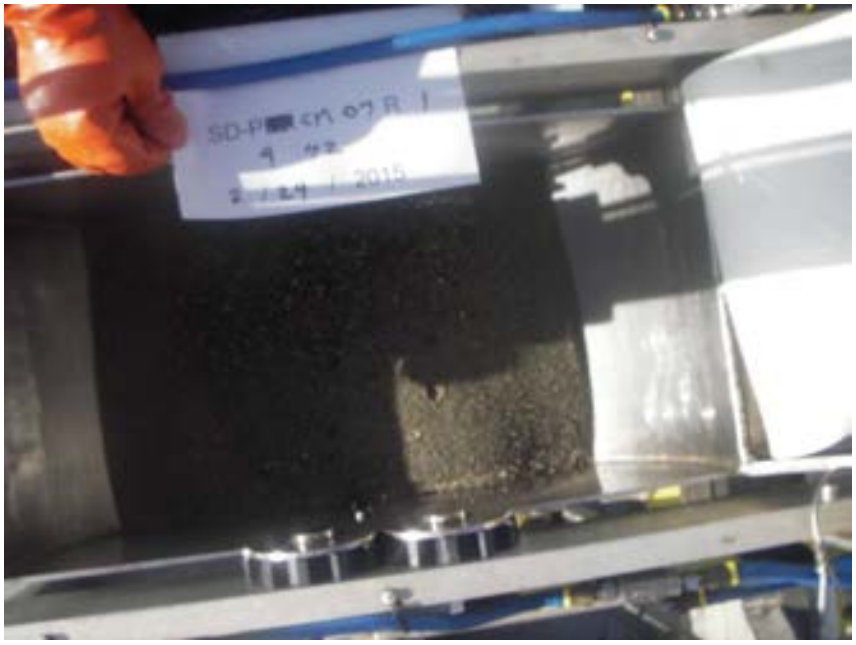
Minor Constituent with trace
Fine (Medium) Coarse Gravel Sand Silt Clay _____

Biological: 0 % **Debris:** 0 % **Oil Sheen:** (None) Trace (<5%) _____ %

Comments:
Fine silt, trace coarse grav brown & grey

AmecFW Proj. BP2 PCM
SD-PCM00715 Initials: _____
QSC Form
Date: 2 /24 /2015 Time: 942

Amn\Field Forms\QSC



Station SD-PCM007

QUALITATIVE SAMPLE CHARACTERISTICS

Page ___ of ___

Coordinate Datum	Date (mm/dd/yy)	Project Location	Sample Identification Number
WA State Plane, N Zone, NAD 83, Survey Ft	2-24-15	Boeing PL2	SD-PCM 008 15

Coordinates		Water Depth				Time
North	East	Depth	Unit	Rep	Gear	
196073	1275401	12.8	f t	\	0.2 Grab	1051

Penetration		Initials	Sulfide	VOA	Weather	Fines (%)
Depth	Unit					
12	c m	GSM			sunny	

Surficial Wood Estimate:

Contact Points _____ X 5 = _____ %

Surficial sediment characteristics:

Biological: 0 % **Debris:** 0 % **Oil Sheen:** (None) Trace (<5%) _____ %

Moisture
Very Wet (Wet) Moist Damp Dry

Color (Circle major & underline modifying)
Light (Medium) Dark Olive Gray (Brown) Black Other _____

Major Constituent (Circle major & underline modifying)
(Fine) Medium Coarse Gravel (Sand) Silt Clay _____

Minor Constituent with trace
Fine (Medium) Coarse Gravel (Sand) Silt Clay trace brown coarse Sand trace medium brown silt

Subsurface sediment characteristics:

Density / Consistency

Sand / Gravel - Very Loose (Loose) Medium Dense Dense Very Dense

Silt / Clay - Very Soft Soft Medium Stiff Stiff Very Stiff Hard

Moisture
Very Wet (Wet) Moist Damp Dry

Color (Circle major & underline modifying)
Light (Medium) Dark Olive Gray (Brown) Black Other _____

Major Constituent (Circle major & underline modifying)
Fine (Medium) Coarse Gravel (Sand) Silt Clay _____

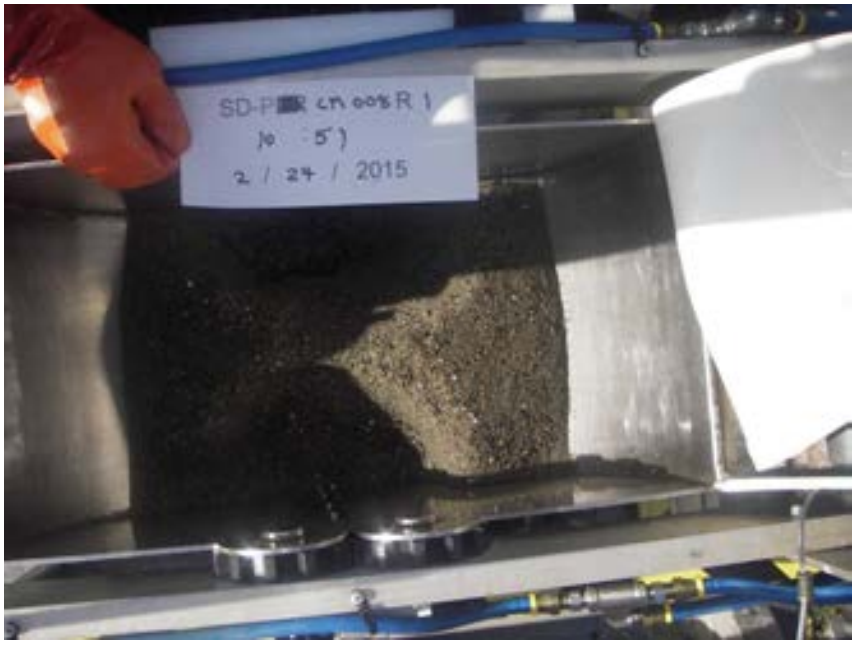
Minor Constituent with trace
Fine Medium (Coarse) Gravel (Sand) Silt Clay _____

Biological: 0 % **Debris:** 0 % **Oil Sheen:** (None) Trace (<5%) _____ %

Comments:

AmecFW Proj. BP2 PCM
SD-PCM00815 Initials: GSM
QSC Form
Date: 2/24/2015 Time: 1051

AmecFW, 3500 188th St. SW, Suite 601, Lynnwood, WA 98037, (425) 921-4000



Station SD-PCM008

QUALITATIVE SAMPLE CHARACTERISTICS

Page ___ of ___

Coordinate Datum	Date (mm/dd/yy)	Project Location	Sample Identification Number
WA State Plane, N Zone, NAD 83, Survey Ft	2-25-15	Boeing PL2	SD-PCM 009 15

Coordinates		Water Depth				Time
North	East	Depth	Unit	Rep	Gear	
195745	1275768	11.0	f t	1	0.2 Grab	1045

Penetration Depth	Penetration Unit	Initials	Sulfide	VOA	Weather	Fines (%)
10	c m	GMS			cloudy	

Surficial Wood Estimate:

Contact Points _____ X 5 = _____ %

Surficial sediment characteristics:

Biological: 2 (1 leaf) % **Debris:** 0 % **Oil Sheen:** (None) Trace (<5%) _____ %

Moisture
Very Wet (Wet) Moist Damp Dry

Color (Circle major & underline modifying)
Light (Medium) Dark Olive Gray (Brown) Black Other _____

Major Constituent (Circle major & underline modifying)
(Fine) Medium Coarse Gravel (Sand) Silt Clay _____

Minor Constituent with trace
(Fine) Medium Coarse Gravel Sand (Silt) Clay _____

Subsurface sediment characteristics:

Density / Consistency

Sand / Gravel - Very Loose (Loose) Medium Dense Dense Very Dense

Silt / Clay - Very Soft Soft Medium Stiff Stiff Very Stiff Hard

Moisture
Very Wet (Wet) Moist Damp Dry

Color (Circle major & underline modifying)
Light (Medium) Dark Olive Gray (Brown) Black Other _____

Major Constituent (Circle major & underline modifying)
Fine (Medium) Coarse Gravel (Sand) Silt Clay _____

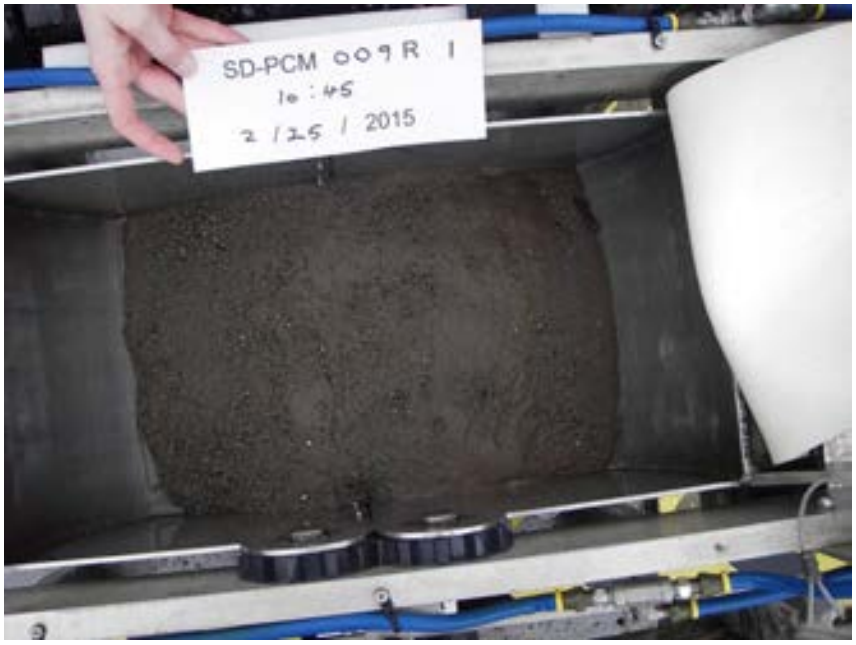
Minor Constituent with trace
(Fine) Medium Coarse Gravel (Sand) Silt Clay _____

Biological: 0 % **Debris:** 0 % **Oil Sheen:** (None) Trace (<5%) _____ %

Comments:
0.5 cm layer of silt

AmecFW Proj. BP2 PCM
SD-PCM00915 Initials: GMS
QSC Form
Date: 2/25/2015 Time: 1045

AmecFW, 3500 188th St. SW, Suite 601, Lynnwood, WA 98037, (425) 921-4000



Station SD-PCM009

QUALITATIVE SAMPLE CHARACTERISTICS

Page ___ of ___

Coordinate Datum	Date (mm/dd/yy)	Project Location	Sample Identification Number
WA State Plane, N Zone, NAD 83, Survey Ft	3-11-15	Boeing PL2	SD-PCM 010 15

Coordinates		Water Depth				Time
North	East	Depth	Unit	Rep	Gear	
19□□53 1987 54	1273238	18.0	f t	1	0.2 Grab	1139

Penetration Depth	Penetration Unit	Initials	Sulfide	VOA	Weather	Fines (%)
15	c m	GSM			cloudy	

Surficial Wood Estimate:

Contact Points _____ X 5 = _____ %

Surficial sediment characteristics:

Biological: 0 % **Debris:** 0 % **Oil Sheen:** None Trace (<5%) _____ %

Moisture
Very Wet Wet Moist Damp Dry

Color (Circle major & underline modifying)
Light Medium Dark Olive Gray Brown Black Other _____

Major Constituent (Circle major & underline modifying)
Fine Medium Coarse Gravel Sand Silt Clay _____

Minor Constituent with trace
Fine Medium Coarse Gravel Sand Silt Clay _____

Subsurface sediment characteristics:

Density / Consistency

Sand / Gravel - Very Loose Loose Medium Dense Dense Very Dense

Silt / Clay - Very Soft Soft Medium Stiff Stiff Very Stiff Hard

Moisture
Very Wet Wet Moist Damp Dry

Color (Circle major & underline modifying)
Light Medium Dark Olive Gray Brown Black Other _____

Major Constituent (Circle major & underline modifying)
Fine Medium Coarse Gravel Sand Silt Clay _____

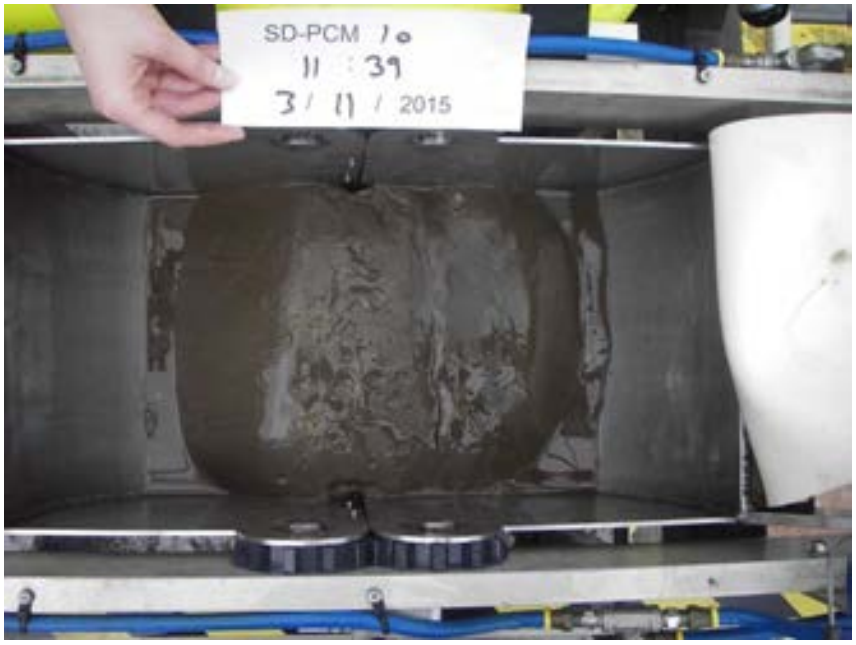
Minor Constituent with trace
Fine Medium Coarse Gravel Sand Silt Clay _____

Biological: 0 % **Debris:** 0 % **Oil Sheen:** None Trace (<5%) _____ %

Comments:
1/4" layer of silt on top of grab.

AmecFW Proj. BP2 PCM
SD-PCM01015 Initials: GSM
QSC Form
Date: 3 / 11 /2015 Time: 1139

Amm\Field Forms\QSC



Station SD-PCM010

QUALITATIVE SAMPLE CHARACTERISTICS

Page ___ of ___

Coordinate Datum	Date (mm/dd/yy)	Project Location	Sample Identification Number
WA State Plane, N Zone, NAD 83, Survey Ft	3-10-15	Boeing PL2	SD-PCM 011 15

Coordinates North	Coordinates East	Water Depth Depth	Unit	Rep	Gear	Time
198189	1272986	10.7	f t	1	0.2 Grab	1341

Penetration Depth	Unit	Initials	Sulfide	VOA	Weather	Fines (%)
20	c m	GSM			cloudy	

Surficial Wood Estimate:

Contact Points _____ X 5 = _____ %

Surficial sediment characteristics:

Biological: <1 (crustacean) % **Debris:** <1 (twigs) % **Oil Sheen:** None Trace (<5%) _____ %

Moisture
Very Wet | Wet | Moist | Damp | Dry

Color (Circle major & underline modifying)
Light | Medium | Dark | Olive | Gray | Brown | Black | Other _____

Major Constituent (Circle major & underline modifying)
Fine | Medium | Coarse | Gravel | Sand | Silt | Clay _____

Minor Constituent with trace
Fine | Medium | Coarse | Gravel | Sand | Silt | Clay _____

Subsurface sediment characteristics:

Density / Consistency

Sand / Gravel - Very Loose | Loose | Medium Dense | Dense | Very Dense

Silt / Clay - Very Soft | Soft | Medium Stiff | Stiff | Very Stiff | Hard

Moisture
Very Wet | Wet | Moist | Damp | Dry

Color (Circle major & underline modifying)
Light | Medium | Dark | Olive | Gray | Brown | Black | Other _____

Major Constituent (Circle major & underline modifying)
Fine | Medium | Coarse | Gravel | Sand | Silt | Clay _____

Minor Constituent with trace
Fine | Medium | Coarse | Gravel | Sand | Silt | Clay _____

Biological: 0 % **Debris:** 0 % **Oil Sheen:** None Trace (<5%) _____ %

Comments:

AmecFW Proj. BP2 PCM
SD-PCM01115 Initials: GSM
QSC Form
Date: 3/10/2015 Time: 1341

AmecFW/Field Forms/QSC

Station SD-PCM011

QUALITATIVE SAMPLE CHARACTERISTICS

Page ___ of ___

Coordinate Datum	Date (mm/dd/yy)	Project Location	Sample Identification Number
WA State Plane, N Zone, NAD 83, Survey Ft	3-11-15	Boeing PL2	SD-PCM 012 15

Coordinates		Water Depth				Time
North	East	Depth	Unit	Rep	Gear	
147900	1273308	17.0	f t	1	0.2 Grab	944

Penetration		Initials	Sulfide	VOA	Weather	Fines (%)
Depth	Unit					
15	c m	GSM			dandy	

Surficial Wood Estimate:

Contact Points _____ X 5 = _____ %

Surficial sediment characteristics:

Biological: 0 % **Debris:** 0 % **Oil Sheen:** (None) Trace (<5%) _____ %

Moisture
Very Wet (Wet) Moist Damp Dry

Color (Circle major & underline modifying)
Light (Medium) Dark Olive Gray (Brown) Black Other _____

Major Constituent (Circle major & underline modifying)
Fine (Medium) Coarse Gravel (Sand) Silt Clay _____

Minor Constituent with trace
(Fine) Medium Coarse Gravel Sand (Silt) Clay _____

Subsurface sediment characteristics:

Density / Consistency

Sand / Gravel - Very Loose (Loose) Medium Dense Dense Very Dense

Silt / Clay - Very Soft Soft Medium Stiff Stiff Very Stiff Hard

Moisture
Very Wet (Wet) Moist Damp Dry

Color (Circle major & underline modifying)
Light (Medium) Dark Olive Gray (Brown) Black Other _____

Major Constituent (Circle major & underline modifying)
Fine (Medium) Coarse Gravel (Sand) Silt Clay _____

Minor Constituent with trace
Fine Medium (Coarse) Gravel (Sand) Silt Clay _____

Biological: 0 % **Debris:** 0 % **Oil Sheen:** (None) Trace (<5%) _____ %

Comments: fine silt on top layer

AmecFW Proj. BP2 PCM
SD-PCM01215 Initials: GSM
QSC Form
Date: 3 / 11 /2015 Time: 944

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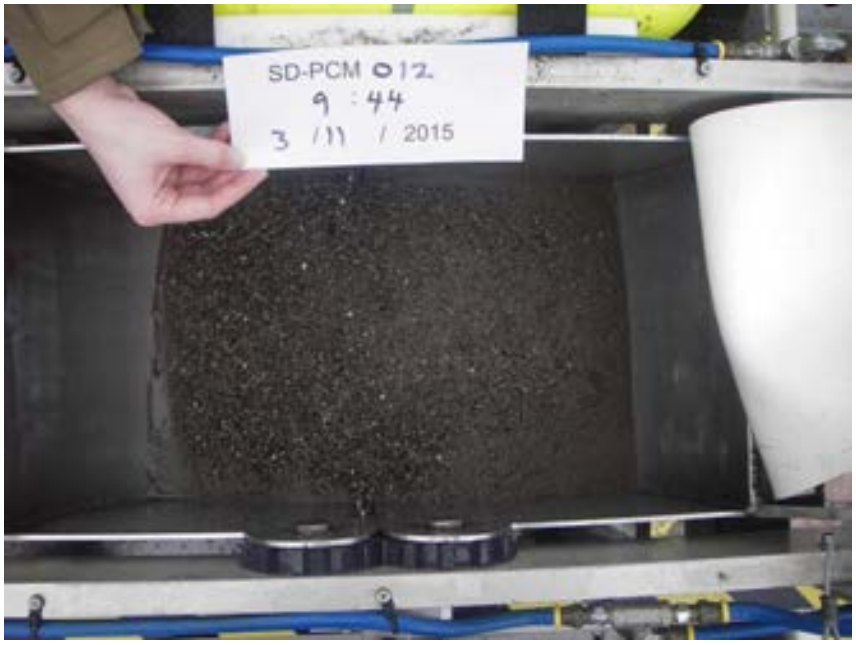


Station SD-PCM012

QUALITATIVE SAMPLE CHARACTERISTICS

Page ___ of ___

Coordinate Datum	Date (mm/dd/yy)	Project Location	Sample Identification Number
WA State Plane, N Zone, NAD 83, Survey Ft	3-11-15	Boeing PL2	SD-PCM 212 15

Coordinates		Water Depth				Time
North	East	Depth	Unit	Rep	Gear	
197900	1273312	16.7	f t	1	0.2 Grab	956

Penetration Depth	Penetration Unit	Initials	Sulfide	VOA	Weather	Fines (%)
17	c m	GSM			cloudy	

Surficial Wood Estimate:

Contact Points _____ X 5 = _____ %

Surficial sediment characteristics:

Biological: 0 % **Debris:** 0 % **Oil Sheen:** None Trace (<5%) _____ %

Moisture
Very Wet Wet Moist Damp Dry

Color (Circle major & underline modifying)
Light Medium Dark Olive Gray Brown Black Other _____

Major Constituent (Circle major & underline modifying)
Fine Medium Coarse Gravel Sand Silt Clay _____

Minor Constituent with trace
Fine Medium Coarse Gravel Sand Silt Clay _____

Subsurface sediment characteristics:

Density / Consistency

Sand / Gravel - Very Loose Loose Medium Dense Dense Very Dense

Silt / Clay - Very Soft Soft Medium Stiff Stiff Very Stiff Hard

Moisture
Very Wet Wet Moist Damp Dry

Color (Circle major & underline modifying)
Light Medium Dark Olive Gray Brown Black Other _____

Major Constituent (Circle major & underline modifying)
Fine Medium Coarse Gravel Sand Silt Clay _____

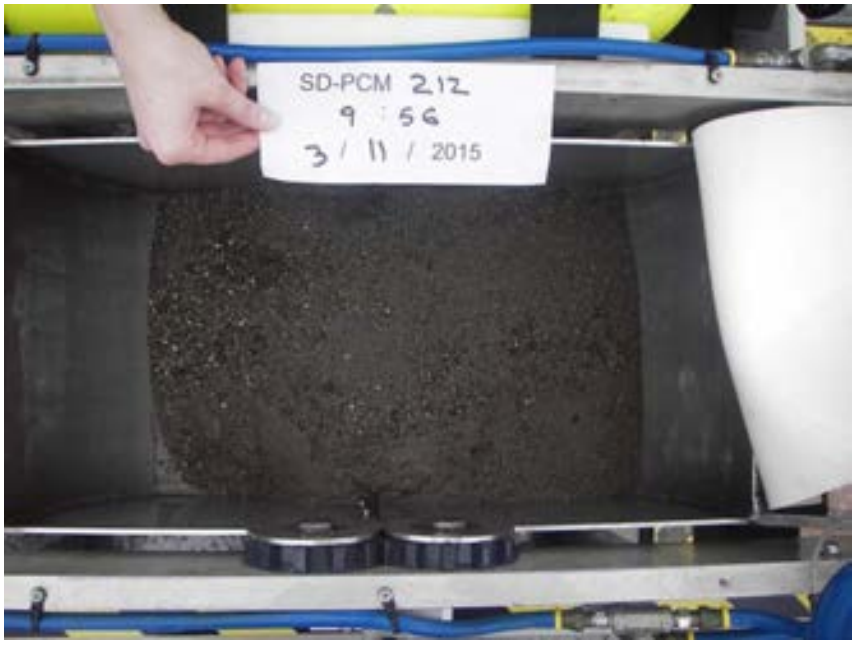
Minor Constituent with trace
Fine Medium Coarse Gravel Sand Silt Clay _____

Biological: 0 % **Debris:** 0 % **Oil Sheen:** None Trace (<5%) _____ %

Comments:
trace silt on top layer

AmecFW Proj. BP2 PCM
SD-PCM21215 Initials: GSM
QSC Form
Date: 3/11/2015 Time: 956

AmecFW\Field Forms\QSC



Station SD-PCM212 (Duplicate of Station SD-PCM012)

QUALITATIVE SAMPLE CHARACTERISTICS

Page ___ of ___

Coordinate Datum	Date (mm/dd/yy)	Project Location	Sample Identification Number
WA State Plane, N Zone, NAD 83, Survey Ft	3-10-15	Boeing PL2	SD-PCM 013 15

Coordinates		Water Depth				Time
North	East	Depth	Unit	Rep	Gear	
197610	1273628	9.6	f t	1	0.2 Grab	1412

Penetration		Initials	Sulfide	VOA	Weather	Fines (%)
Depth	Unit					
15	c m	GSN			P cloudy	

Surficial Wood Estimate:

Contact Points _____ X 5 = _____ %

Surficial sediment characteristics:

Biological: 0 % **Debris:** 0 % **Oil Sheen:** None Trace (<5%) _____ %

Moisture
Very Wet Wet Moist Damp Dry

Color (Circle major & underline modifying)
Light Medium Dark Olive Gray Brown Black Other _____

Major Constituent (Circle major & underline modifying)
Fine Medium Coarse Gravel Sand Silt Clay _____

Minor Constituent with trace
Fine Medium Coarse Gravel Sand Silt Clay _____

Subsurface sediment characteristics:

Density / Consistency

Sand / Gravel - Very Loose Loose Medium Dense Dense Very Dense

Silt / Clay - Very Soft Soft Medium Stiff Stiff Very Stiff Hard

Moisture
Very Wet Wet Moist Damp Dry

Color (Circle major & underline modifying)
Light Medium Dark Olive Gray Brown Black Other _____

Major Constituent (Circle major & underline modifying)
Fine Medium Coarse Gravel Sand Silt Clay _____

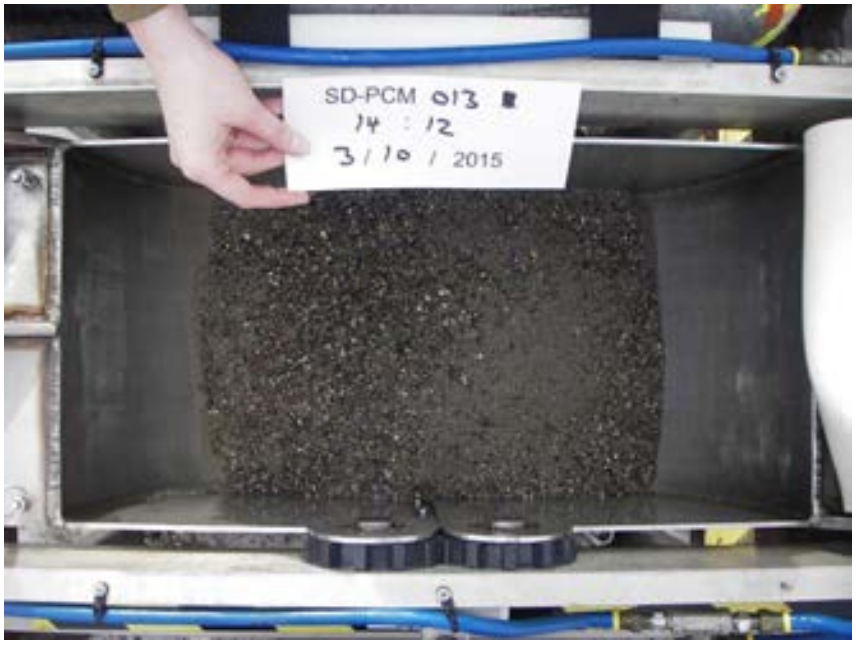
Minor Constituent with trace
Fine Medium Coarse Gravel Sand Silt Clay _____

Biological: 0 % **Debris:** 0 % **Oil Sheen:** None Trace (<5%) _____ %

Comments:
1403 attempt 1 reject - poor penetration
attempt 2 success

AmecFW Proj. BP2 PCM
SD-PCM01315 Initials: GSN
QSC Form
Date: 3/10/2015 Time: 1412

AmecFW/Field Forms/QSC



Station SD-PCM013

QUALITATIVE SAMPLE CHARACTERISTICS

Page ___ of ___

Coordinate Datum	Date (mm/dd/yy)	Project Location	Sample Identification Number
WA State Plane, N Zone, NAD 83, Survey Ft	3-10-15	Boeing PL2	SD-PCM 014 15

Coordinates		Water Depth					Time
North	East	Depth	Unit		Rep	Gear	
197325	1273948	10.6	f	t	1	0.2 Grab	1305

Penetration						
Depth	Unit	Initials	Sulfide	VOA	Weather	Fines (%)
13	c m	SM			Sunny	

Surficial Wood Estimate:

Contact Points _____ X 5 = _____ %

Surficial sediment characteristics:

Biological: 0 % **Debris:** 0 % **Oil Sheen:** (None) Trace (<5%) _____ %

Moisture
Very Wet (Wet) Moist Damp Dry

Color (Circle major & underline modifying)
Light (Medium) Dark Olive Gray (Brown) Black Other _____

Major Constituent (Circle major & underline modifying)
(Fine) Medium Coarse Gravel (Sand) Silt Clay _____

Minor Constituent with trace
Fine (Medium) Coarse Gravel (Sand) Silt Clay _____

Subsurface sediment characteristics:

Density / Consistency

Sand / Gravel - Very Loose (Loose) Medium Dense Dense Very Dense

Silt / Clay - Very Soft Soft Medium Stiff Stiff Very Stiff Hard

Moisture
Very Wet (Wet) Moist Damp Dry

Color (Circle major & underline modifying)
Light (Medium) Dark Olive Gray (Brown) Black Other _____

Major Constituent (Circle major & underline modifying)
Fine (Medium) Coarse Gravel (Sand) Silt Clay _____

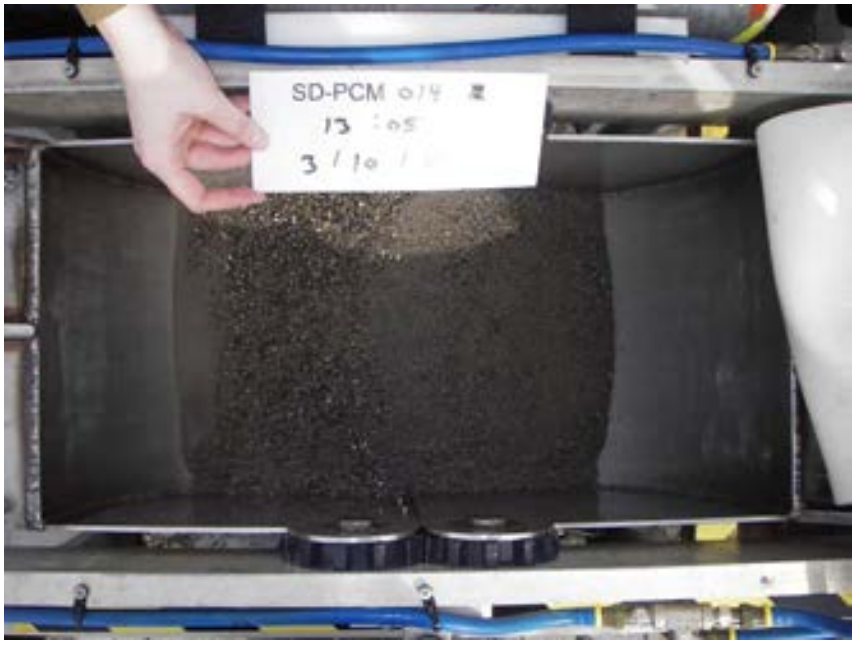
Minor Constituent with trace
Fine Medium (Coarse) Gravel (Sand) Silt Clay _____

Biological: 0 % **Debris:** 0 % **Oil Sheen:** (None) Trace (<5%) _____ %

Comments:
trace silt on top layer.

AmecFW Proj. BP2 PCM
SD-PCM01415 Initials: SM
QSC Form
Date: 3/10/2015 Time: 1305

AmecField Forms\QSC



Station SD-PCM014

QUALITATIVE SAMPLE CHARACTERISTICS

Page ___ of ___

Coordinate Datum	Date (mm/dd/yy)	Project Location	Sample Identification Number
WA State Plane, N Zone, NAD 83, Survey Ft	3-11-15	Boeing PL2	SD-PCM 015 15

Coordinates		Water Depth					Time
North	East	Depth	Unit		Rep	Gear	
197031	1274273	16.4	f	t	1	0.2 Grab	849

Penetration						
Depth	Unit	Initials	Sulfide	VOA	Weather	Fines (%)
10	c m	GM			rain	

Surficial Wood Estimate:

Contact Points _____ X 5 = _____ %

Surficial sediment characteristics:

Biological: 0 % **Debris:** 0 % **Oil Sheen:** None Trace (<5%) _____ %

Moisture
Very Wet Wet Moist Damp Dry

Color (Circle major & underline modifying)
Light Medium Dark Olive Gray Brown Black Other _____

Major Constituent (Circle major & underline modifying)
Fine Medium Coarse Gravel Sand Silt Clay _____

Minor Constituent with trace
Fine Medium Coarse Gravel Sand Silt Clay _____

Subsurface sediment characteristics:

Density / Consistency

Sand / Gravel - Very Loose Loose Medium Dense Dense Very Dense

Silt / Clay - Very Soft Soft Medium Stiff Stiff Very Stiff Hard

Moisture
Very Wet Wet Moist Damp Dry

Color (Circle major & underline modifying)
Light Medium Dark Olive Gray Brown Black Other _____

Major Constituent (Circle major & underline modifying)
Fine Medium Coarse Gravel Sand Silt Clay _____

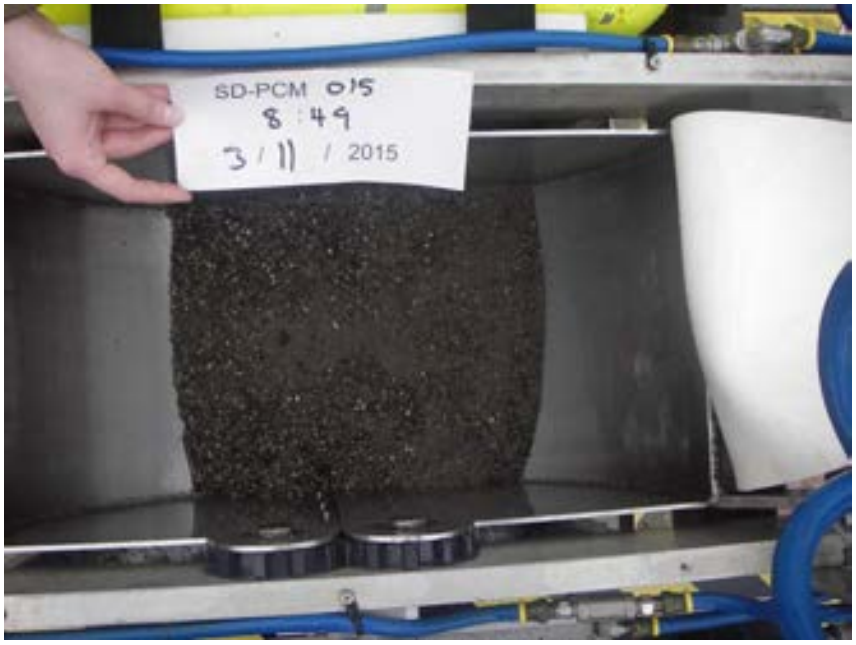
Minor Constituent with trace
Fine Medium Coarse Gravel Sand Silt Clay _____

Biological: 0 % **Debris:** 0 % **Oil Sheen:** None Trace (<5%) _____ %

Comments:

AmecFW Proj. BP2 PCM
SD-PCM01515 Initials: GSD
QSC Form
Date: 3 / 11 /2015 Time: 849

AmecFW\Field Forms\QSC



Station SD-PCM015

QUALITATIVE SAMPLE CHARACTERISTICS

Page ___ of ___

Coordinate Datum	Date (mm/dd/yy)	Project Location	Sample Identification Number
WA State Plane, N Zone, NAD 83, Survey Ft	3-10-15	Boeing PL2	SD-PCM 016 15

Coordinates		Water Depth				Time
North	East	Depth	Unit	Rep	Gear	
196701	1274643	16.9	f t	1	0.2 Grab	1003

Penetration							
Depth	Unit	Initials	Sulfide	VOA	Weather	Fines (%)	
10	c m	GSM			Cloudy		

Surficial Wood Estimate:

Contact Points _____ X 5 = _____ %

Surficial sediment characteristics:

Biological: 0 % **Debris:** 0 % **Oil Sheen:** (None) Trace (<5%) _____ %

Moisture
Very Wet (Wet) Moist Damp Dry

Color **(Circle major & underline modifying)**
Light (Medium) Dark Olive Gray (Brown) Black Other _____

Major Constituent **(Circle major & underline modifying)**
Fine (Medium) Coarse Gravel (Sand) Silt Clay _____

Minor Constituent with trace
(Fine) Medium Coarse Gravel (Sand) Silt Clay _____

Subsurface sediment characteristics:

Density / Consistency

Sand / Gravel - Very Loose (Loose) Medium Dense Dense Very Dense

Silt / Clay - Very Soft Soft Medium Stiff Stiff Very Stiff Hard

Moisture
Very Wet (Wet) Moist Damp Dry

Color **(Circle major & underline modifying)**
Light (Medium) Dark Olive Gray (Brown) Black Other _____

Major Constituent **(Circle major & underline modifying)**
Fine (Medium) Coarse Gravel (Sand) Silt Clay _____

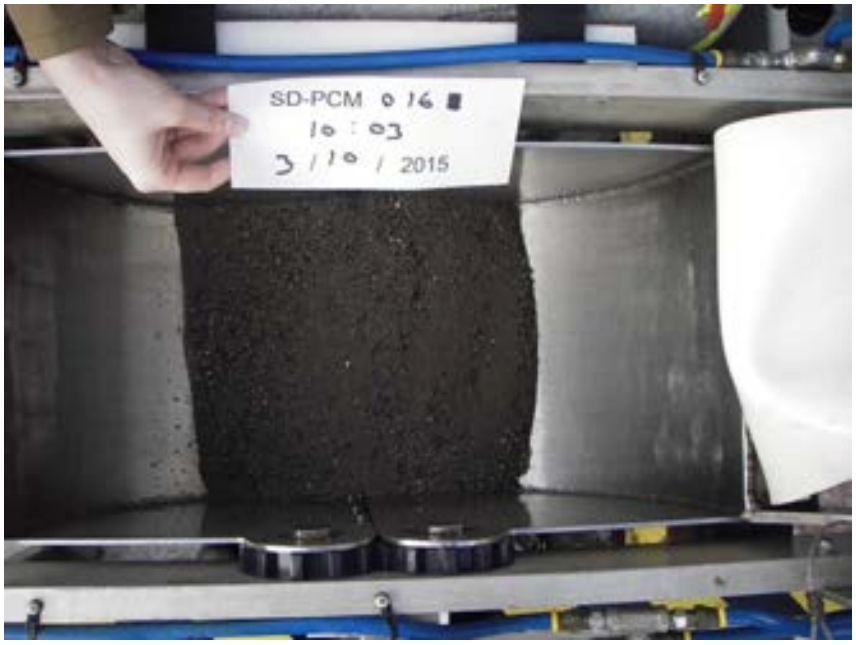
Minor Constituent with trace
Fine Medium (Coarse) Gravel (Sand) Silt Clay _____

Biological: 0 % **Debris:** 0 % **Oil Sheen:** (None) Trace (<5%) _____ %

Comments:

AmecFW Proj. BP2 PCM
SD-PCM01615 Initials: GSM
QSC Form
Date: 3 / 10 /2015 Time: 1003

AmnField Forms\QSC



Station SD-PCM016

QUALITATIVE SAMPLE CHARACTERISTICS

Coordinate Datum	Date (mm/dd/yy)	Project Location	Sample Identification Number
WA State Plane, N Zone, NAD 83, Survey Ft	2-24-15	Boeing PL2	SD-PCM 017 15

Coordinates		Water Depth				Time
North	East	Depth	Unit	Rep	Gear	
196454	1274915	21.3	f t	1	0.2 Grab	913

Penetration Depth	Penetration Unit	Initials	Sulfide	VOA	Weather	Fines (%)
\\	c m	GSM			sunny	

Surficial Wood Estimate:

Contact Points _____ X 5 = _____ %

Surficial sediment characteristics:

Biological: 0 % **Debris:** 0 % **Oil Sheen:** (None) Trace (<5%) _____ %

Moisture
Very Wet (Wet) Moist Damp Dry

Color (Circle major & underline modifying)
Light (Medium) Dark Olive Gray (Brown) Black Other _____

Major Constituent (Circle major & underline modifying)
(Fine) Medium Coarse Gravel (Sand) Silt Clay _____

Minor Constituent with trace
Fine (Medium) Coarse Gravel (Sand) Silt Clay _____

Subsurface sediment characteristics:

Density / Consistency

Sand / Gravel - Very Loose Loose (Medium Dense) Dense Very Dense

Silt / Clay - Very Soft Soft Medium Stiff Stiff Very Stiff Hard

Moisture
Very Wet (Wet) Moist Damp Dry

Color (Circle major & underline modifying)
Light (Medium) Dark Olive Gray (Brown) Black Other _____

Major Constituent (Circle major & underline modifying)
(Fine) Medium Coarse Gravel (Sand) Silt Clay _____

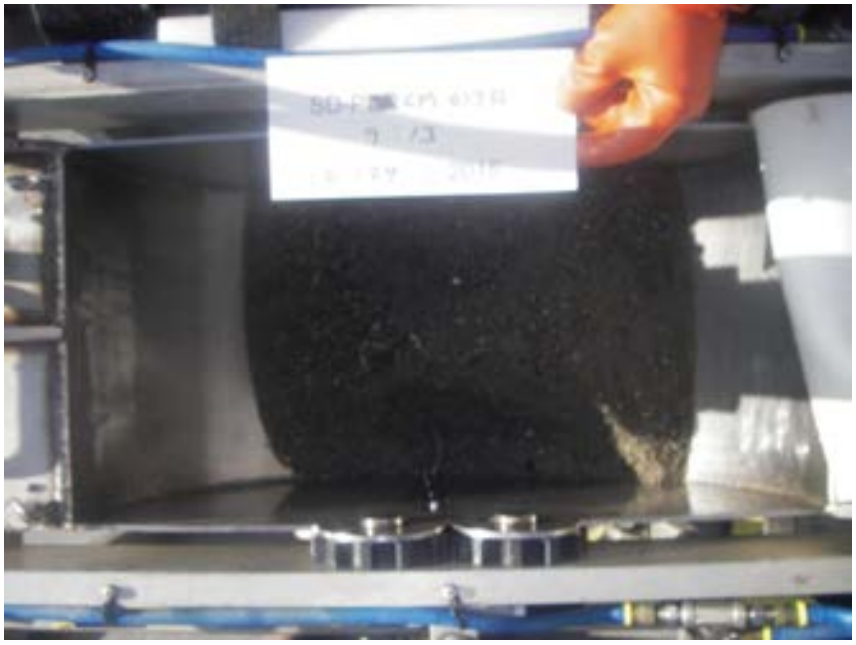
Minor Constituent with trace
Fine (Medium) Coarse Gravel (Sand) Silt Clay _____

Biological: _____ % **Debris:** _____ % **Oil Sheen:** None Trace (<5%) _____ %

Comments:
Trace silt in undisturbed portion, leakage and loss of some material during pull up

AmecFW Proj. BP2 PCM
SD-PCM01715 Initials: GSM
QSC Form
Date: 2 / 24 /2015 Time: 913

AmecFW, 3500 188th St. SW, Suite 601, Lynnwood, WA 98037, (425) 921-4000



Station SD-PCM017

QUALITATIVE SAMPLE CHARACTERISTICS

Page ___ of ___

Coordinate Datum	Date (mm/dd/yy)	Project Location	Sample Identification Number
WA State Plane, N Zone, NAD 83, Survey Ft	2-24-15	Boeing PL2	SD-PCM 018 15

Coordinates		Water Depth				Time
North	East	Depth	Unit	Rep	Gear	
196164	1275232	17.4	f t	1	0.2 Grab	1132

Penetration		Initials	Sulfide	VOA	Weather	Fines (%)
Depth	Unit					
13	c m	SM			Sunny	

Surficial Wood Estimate:

Contact Points _____ X 5 = _____ %

Surficial sediment characteristics:

Biological: 0 % **Debris:** 0 % **Oil Sheen:** (None) Trace (<5%) _____ %

Moisture
Very Wet (Wet) Moist Damp Dry

Color (Circle major & underline modifying)
Light (Medium) Dark Olive Gray (Brown) Black Other _____

Major Constituent (Circle major & underline modifying)
(Fine) Medium Coarse Gravel (Sand) Silt Clay _____

Minor Constituent with trace
Fine (Medium) Coarse Gravel (Sand) Silt Clay trace brown silt

Subsurface sediment characteristics:

Density / Consistency

Sand / Gravel - Very Loose (Loose) Medium Dense Dense Very Dense

Silt / Clay - Very Soft Soft Medium Stiff Stiff Very Stiff Hard

Moisture
Very Wet (Wet) Moist Damp Dry

Color (Circle major & underline modifying)
Light (Medium) Dark Olive Gray (Brown) Black Other _____

Major Constituent (Circle major & underline modifying)
Fine (Medium) Coarse Gravel (Sand) Silt Clay _____

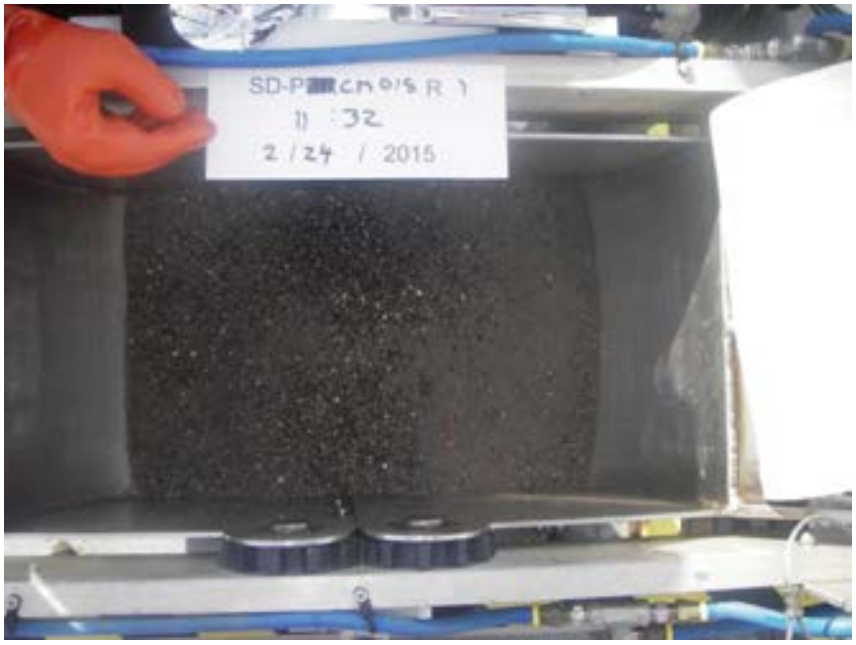
Minor Constituent with trace
Fine Medium (Coarse) Gravel (Sand) Silt Clay _____

Biological: 10 % **Debris:** 0 % **Oil Sheen:** (None) Trace (<5%) _____ %

Comments:

AmecFW Proj. BP2 PCM
SD-PCM01815 Initials: SM
QSC Form
Date: 2 /24 /2015 Time: 1132

Amn\Field Forms\QSC



Station SD-PCM018

QUALITATIVE SAMPLE CHARACTERISTICS

Page ___ of ___

Coordinate Datum	Date (mm/dd/yy)	Project Location	Sample Identification Number
WA State Plane, N Zone, NAD 83, Survey Ft	2-27-15	Boeing PL2	SD-PCM 218 15

2-24-15

Coordinates		Water Depth				Time
North	East	Depth	Unit	Rep	Gear	
196162	1275230	16.8	f t		0.2 Grab	1146

Penetration Depth	Penetration Unit	Initials	Sulfide	VOA	Weather	Fines (%)
15	c m	GM			sunny	

Surficial Wood Estimate:

Contact Points _____ X 5 = _____ %

Surficial sediment characteristics:

Biological: 0 % **Debris:** 0 % **Oil Sheen:** None Trace (<5%) _____ %

Moisture
Very Wet **Wet** Moist Damp Dry

Color (Circle major & underline modifying)
Light Medium Dark Olive Gray **Brown** Black Other _____

Major Constituent (Circle major & underline modifying)
Fine Medium Coarse Gravel **Sand** Silt Clay _____

Minor Constituent with trace
Fine Medium Coarse Gravel Sand **Silt** Clay _____

Subsurface sediment characteristics:

Density / Consistency

Sand / Gravel - Very Loose **Loose** Medium Dense Dense Very Dense

Silt / Clay - Very Soft Soft Medium Stiff Stiff Very Stiff Hard

Moisture
Very Wet **Wet** Moist Damp Dry

Color (Circle major & underline modifying)
Light Medium **Dark** Olive Gray **Brown** Black Other _____

Major Constituent (Circle major & underline modifying)
Fine **Medium** Coarse Gravel **Sand** Silt Clay _____

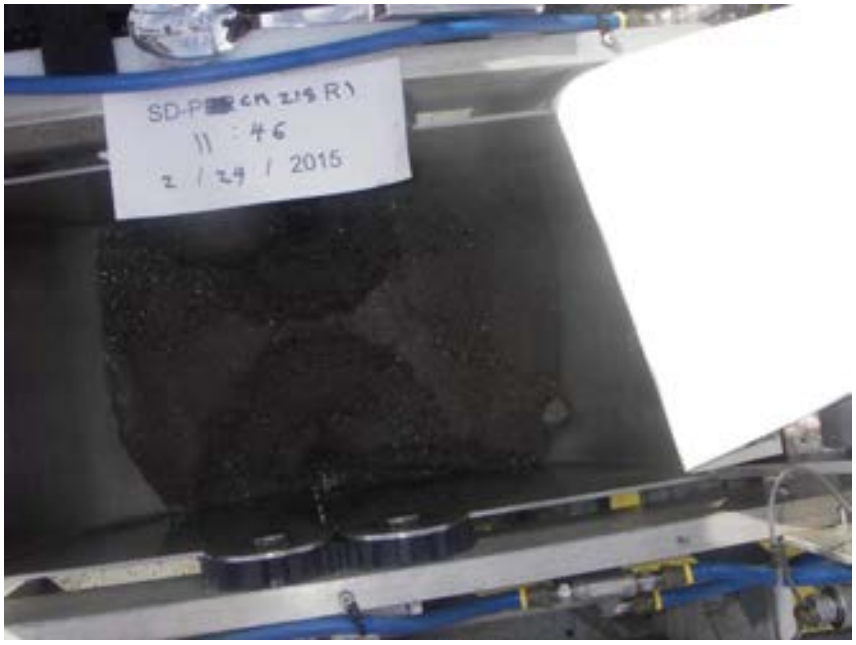
Minor Constituent with trace
Fine Medium **Coarse** Gravel **Sand** Silt Clay _____

Biological: 0 % **Debris:** 0 % **Oil Sheen:** None Trace (<5%) _____ %

Comments:

AmecFW Proj. BP2 PCM
SD-PCM21815 Initials: GM
QSC Form
Date: 2 / 24 /2015 Time: 1146

AmecFW\Field Forms\QSC



Station SD-PCM218 (Replicate of Station SD-PCM018)

QUALITATIVE SAMPLE CHARACTERISTICS

Page ___ of ___

Coordinate Datum	Date (mm/dd/yy)	Project Location	Sample Identification Number
WA State Plane, N Zone, NAD 83, Survey Ft	2-24-15	Boeing PL2	SD-PCM 019 15

Coordinates		Water Depth				Time
North	East	Depth	Unit	Rep	Gear	
195875	1275555	10.2	f t	\	0.2 Grab	1501

Penetration							
Depth	Unit	Initials	Sulfide	VOA	Weather	Fines (%)	
17	c m	CSM			Cloudy		

Surficial Wood Estimate:

Contact Points _____ X 5 = _____ %

Surficial sediment characteristics:

Biological: 0 % **Debris:** 0 % **Oil Sheen:** (None) Trace (<5%) _____ %

Moisture
Very Wet (Wet) Moist Damp Dry

Color **(Circle major & underline modifying)**
Light (Medium) Dark Olive Gray (Brown) Black Other _____

Major Constituent **(Circle major & underline modifying)**
(Fine) Medium Coarse Gravel (Sand) Silt Clay _____

Minor Constituent with trace
Fine (Medium) Coarse Gravel (Sand) Silt Clay trace silt

Subsurface sediment characteristics:

Density / Consistency

Sand / Gravel - Very Loose (Loose) Medium Dense Dense Very Dense

Silt / Clay - Very Soft Soft Medium Stiff Stiff Very Stiff Hard

Moisture
Very Wet (Wet) Moist Damp Dry

Color **(Circle major & underline modifying)**
Light (Medium) Dark Olive Gray (Brown) Black Other _____

Major Constituent **(Circle major & underline modifying)**
Fine (Medium) Coarse Gravel (Sand) Silt Clay _____

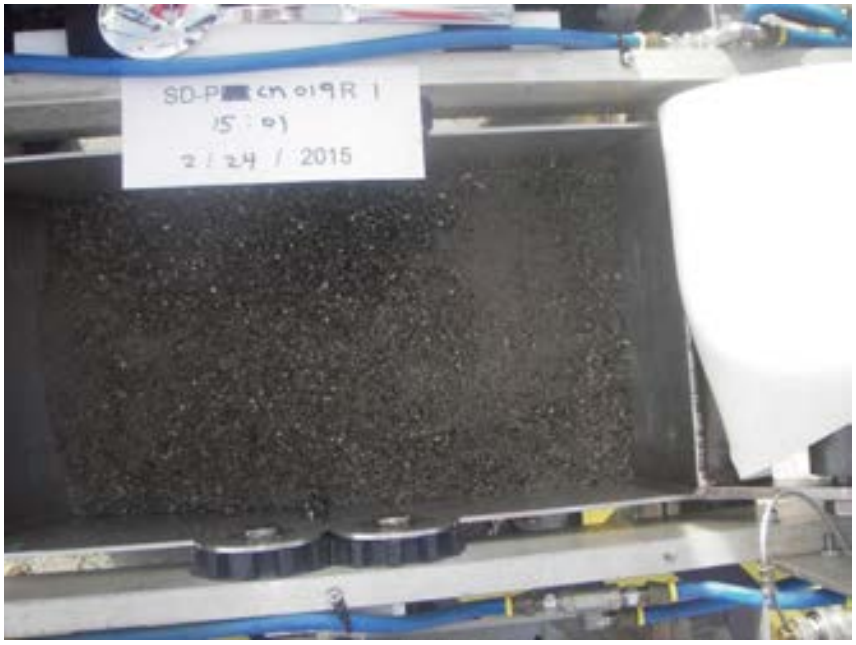
Minor Constituent with trace
(Fine) Medium Coarse Gravel (Sand) Silt Clay _____

Biological: 0 % **Debris:** 0 % **Oil Sheen:** (None) Trace (<5%) _____ %

Comments:

AmecFW Proj. BP2 PCM
SD-PCM01915 Initials: CSM
QSC Form
Date: 2/24/2015 Time: 1501

AmnFW\Field Forms\QSC



Station SD-PCM019

QUALITATIVE SAMPLE CHARACTERISTICS

Page ___ of ___

Coordinate Datum	Date (mm/dd/yy)	Project Location	Sample Identification Number
WA State Plane, N Zone, NAD 83, Survey Ft	3-11-15	Boeing PL2	SD-PCM 020 15

19□3□9 Coordinates		Water Depth				Time
North	East	Depth	Unit	Rep	Gear	
198399	1272994	6.1	f t	1	0.2 Grab	1047

Penetration Depth	Penetration Unit	Initials	Sulfide	VOA	Weather	Fines (%)
11	c m	EJM			rain	

Surficial Wood Estimate:

Contact Points _____ X 5 = _____ %

Surficial sediment characteristics:

Biological: 0 % **Debris:** <1 % **Oil Sheen:** None Trace (<5%) _____ %

Moisture
Very Wet (Wet) Moist Damp Dry

Color (Circle major & underline modifying)
Light (Medium) Dark Olive Gray (Brown) Black Other _____

Major Constituent (Circle major & underline modifying)
(Fine) Medium Coarse Gravel Sand (Silt) Clay _____

Minor Constituent with trace
Fine Medium Coarse Gravel Sand Silt Clay _____

Subsurface sediment characteristics:

Density / Consistency

Sand / Gravel - Very Loose Loose (Medium Dense) Dense Very Dense

Silt / Clay - Very Soft Soft Medium Stiff Stiff Very Stiff Hard

Moisture
Very Wet Wet Moist Damp Dry

Color (Circle major & underline modifying)
Light Medium (Dark) Olive Gray Brown (Black) Other trace orange

Major Constituent (Circle major & underline modifying)
(Fine) Medium Coarse Gravel Sand (Silt) Clay _____

Minor Constituent with trace
(Fine) Medium Coarse Gravel (Sand) Silt Clay _____

Biological: 0 % **Debris:** 5 % **Oil Sheen:** (None) Trace (<5%) _____ %

Comments:
tw igs on surface
dense fibers approx 1" below surface and sticking out of bottom of grab
orange color near mudline depth

AmecFW Proj. BP2 PCM
SD-PCM02015 Initials: EJM
QSC Form
Date: 3/11/2015 Time: 1047

AmecField Forms\QSC

Station SD-PCM020

QUALITATIVE SAMPLE CHARACTERISTICS

Page ___ of ___

Coordinate Datum	Date (mm/dd/yy)	Project Location	Sample Identification Number
WA State Plane, N Zone, NAD 83, Survey Ft	3-11-15	Boeing PL2	SD-PCM 021 15

Coordinates		Water Depth				Time
North	East	Depth	Unit	Rep	Gear	
198281	1272991	5.3	f t	1	0.2 Grab	1030

Penetration Depth	Penetration Unit	Initials	Sulfide	VOA	Weather	Fines (%)
14	c m	GSM			rain	

Surficial Wood Estimate:

Contact Points _____ X 5 = _____ %

Surficial sediment characteristics:

Biological: 0 % **Debris:** 0 % **Oil Sheen:** None Trace (<5%) _____ %

Moisture
Very Wet Wet Moist Damp Dry

Color (Circle major & underline modifying)
Light Medium Dark Olive Gray Brown Black Other _____

Major Constituent (Circle major & underline modifying)
Fine Medium Coarse Gravel Sand Silt Clay _____

Minor Constituent with trace
Fine Medium Coarse Gravel Sand Silt Clay _____

Subsurface sediment characteristics:

Density / Consistency

Sand / Gravel - Very Loose Loose Medium Dense Dense Very Dense

Silt / Clay - Very Soft Soft Medium Stiff Stiff Very Stiff Hard

Moisture
Very Wet Wet Moist Damp Dry

Color (Circle major & underline modifying)
Light Medium Dark Olive Gray Brown Black Other _____

Major Constituent (Circle major & underline modifying)
Fine Medium Coarse Gravel Sand Silt Clay _____

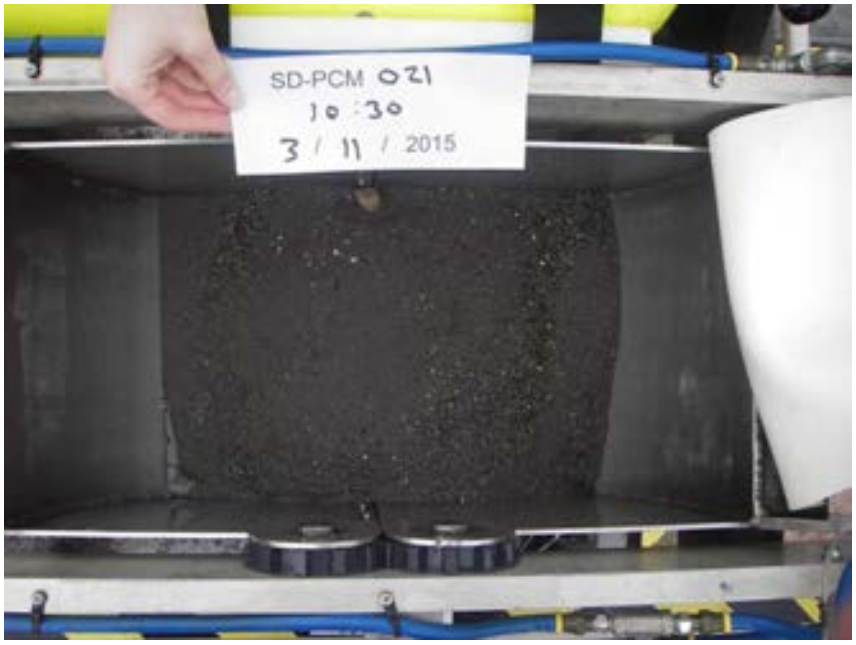
Minor Constituent with trace
Fine Medium Coarse Gravel Sand Silt Clay _____

Biological: 0 % **Debris:** 0 % **Oil Sheen:** None Trace (<5%) _____ %

Comments:

AmecFW Proj. BP2 PCM
SD-PCM02115 Initials: GSM
QSC Form
Date: 3/11/2015 Time: 1030

AmecFW\Field Forms\QSC



Station SD-PCM021

QUALITATIVE SAMPLE CHARACTERISTICS

Page ___ of ___

Coordinate Datum	Date (mm/dd/yy)	Project Location	Sample Identification Number
WA State Plane, N Zone, NAD 83, Survey Ft	3-10-15	Boeing PL2	SD-PCM @ 22 15

Coordinates		Water Depth				Time
North	East	Depth	Unit	Rep	Gear	
146689	1274829	6.4	f t	1	0.2 Grab	1115

Penetration Depth	Penetration Unit	Initials	Sulfide	VOA	Weather	Fines (%)
21	c m	GSM			S cloudy	

Surficial Wood Estimate:

Contact Points _____ X 5 = _____ %

Surficial sediment characteristics:

Biological: 0 % **Debris:** 0 % **Oil Sheen:** None Trace (<5%) _____ %

Moisture
Very Wet Wet Moist Damp Dry

Color (Circle major & underline modifying)
Light Medium Dark Olive Gray Brown Black Other _____

Major Constituent (Circle major & underline modifying)
Fine Medium Coarse Gravel Sand Silt Clay _____

Minor Constituent with trace
Fine Medium Coarse Gravel Sand Silt Clay _____

Subsurface sediment characteristics:

Density / Consistency

Sand / Gravel - Very Loose Loose Medium Dense Dense Very Dense

Silt / Clay - Very Soft Soft Medium Stiff Stiff Very Stiff Hard

Moisture
Very Wet Wet Moist Damp Dry

Color (Circle major & underline modifying)
Light Medium Dark Olive Gray Brown Black Other _____

Major Constituent (Circle major & underline modifying)
Fine Medium Coarse Gravel Sand Silt Clay _____

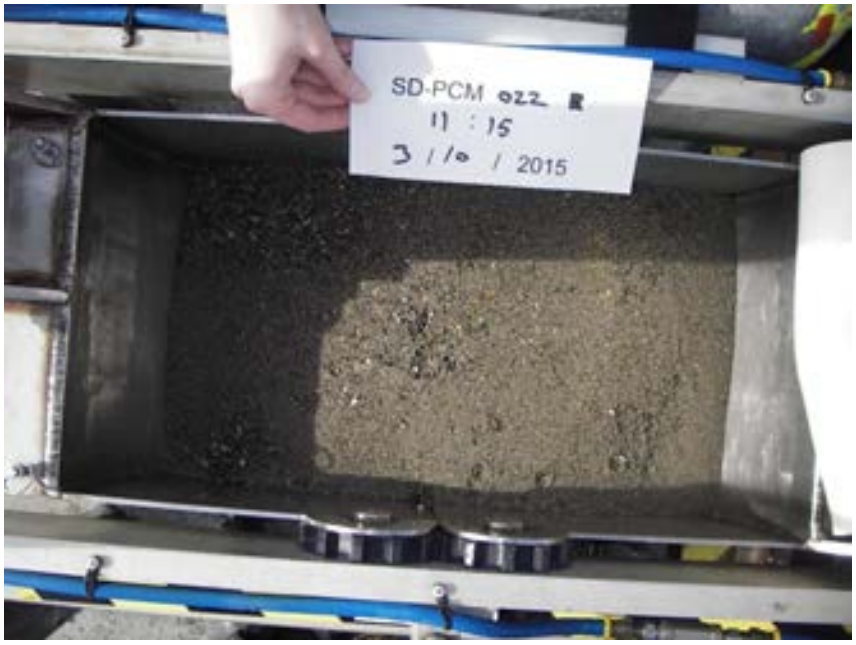
Minor Constituent with trace
Fine Medium Coarse Gravel Sand Silt Clay _____

Biological: 0 % **Debris:** 0 % **Oil Sheen:** None Trace (<5%) _____ %

Comments:
1139 attempt 1 reject - poor penetration
attempt 2 successful

AmecFW Proj. BP2 PCM
SD-PCM02215 Initials: GSM
QSC Form
Date: 3 / 10 /2015 Time: 1115

Amir\Field Forms\QSC



Station SD-PCM022

QUALITATIVE SAMPLE CHARACTERISTICS

Page ___ of ___

Coordinate Datum	Date (mm/dd/yy)	Project Location	Sample Identification Number
WA State Plane, N Zone, NAD 83, Survey Ft	2-24-15	Boeing PL2	SD-PCM 023 15

Coordinates		Water Depth				Time
North	East	Depth	Unit	Rep	Gear	
196374	1275190	8.2	f t	1	0.2 Grab	1016

Penetration Depth	Penetration Unit	Initials	Sulfide	VOA	Weather	Fines (%)
15	c m	GSM			Sunny	

Surficial Wood Estimate:

Contact Points _____ X 5 = _____ %

Surficial sediment characteristics:

Biological: 0 % **Debris:** 0 % **Oil Sheen:** None Trace (<5%) _____ %

Moisture
Very Wet (Wet) Moist Damp Dry

Color **(Circle major & underline modifying)**
(Light) Medium Dark Olive Gray (Brown) Black Other _____

Major Constituent **(Circle major & underline modifying)**
Fine (Medium) Coarse Gravel (Sand) Silt Clay _____

Minor Constituent with trace
(Fine) Medium Coarse Gravel (Sand) Silt Clay _____

Subsurface sediment characteristics:

Density / Consistency

Sand / Gravel - Very Loose (Loose) Medium Dense Dense Very Dense

Silt / Clay - Very Soft Soft Medium Stiff Stiff Very Stiff Hard

Moisture
Very Wet (Wet) Moist Damp Dry

Color **(Circle major & underline modifying)**
Light (Medium) Dark Olive Gray (Brown) Black Other _____

Major Constituent **(Circle major & underline modifying)**
Fine (Medium) Coarse Gravel (Sand) Silt Clay _____

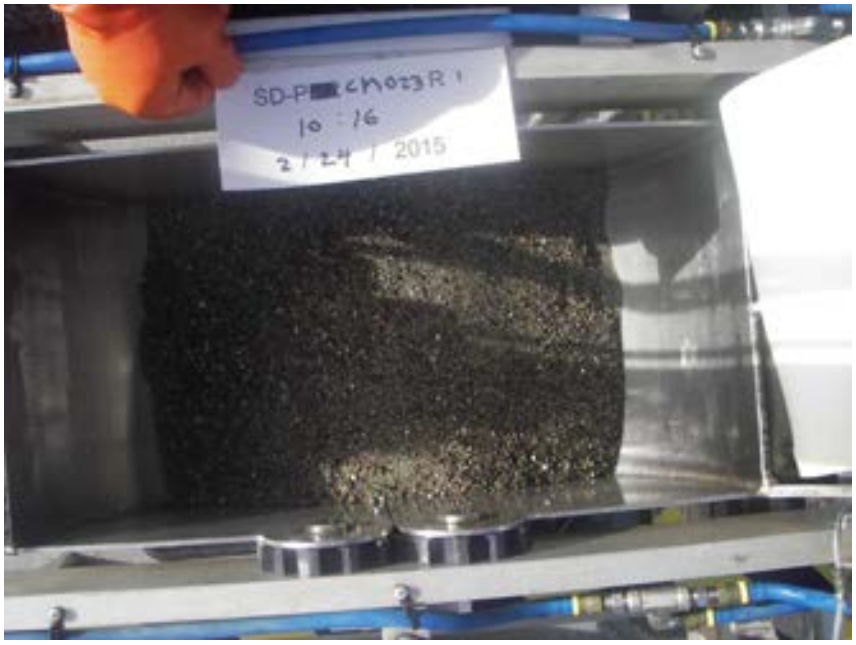
Minor Constituent with trace
(Fine) Medium Coarse Gravel (Sand) Silt Clay _____

Biological: 0 % **Debris:** 0 % **Oil Sheen:** None Trace (<5%) _____ %

Comments:
Trace brown coarse sand

AmecFW Proj. BP2 PCM
SD-PCM02315 Initials: GSM
QSC Form
Date: 2/24/2015 Time: 1016

AmecFW\Field Forms\QSC



Station SD-PCM023

QUALITATIVE SAMPLE CHARACTERISTICS

Page ___ of ___

Coordinate Datum	Date (mm/dd/yy)	Project Location	Sample Identification Number
WA State Plane, N Zone, NAD 83, Survey Ft	2-24-15	Boeing PL2	SD-PCM 223 15

Coordinates		Water Depth				Time
North	East	Depth	Unit	Rep	Gear	
196373	1275187	8.5	f t	1	0.2 Grab	1030

Penetration Depth	Penetration Unit	Initials	Sulfide	VOA	Weather	Fines (%)
12	c m	GM			sunny	

Surficial Wood Estimate:

Contact Points _____ X 5 = _____ %

Surficial sediment characteristics:

Biological: 0 % **Debris:** 0 % **Oil Sheen:** (None) Trace (<5%) _____ %

Moisture
Very Wet (Wet) Moist Damp Dry

Color (Circle major & underline modifying)
Light (Medium) Dark Olive Gray (Brown) Black Other _____

Major Constituent (Circle major & underline modifying)
Fine (Medium) Coarse Gravel (Sand) Silt Clay _____

Minor Constituent with trace
Fine Medium (Coarse) Gravel (Sand) Silt Clay _____

Subsurface sediment characteristics:

Density / Consistency

Sand / Gravel - Very Loose Loose (Medium Dense) Dense Very Dense

Silt / Clay - Very Soft Soft Medium Stiff Stiff Very Stiff Hard

Moisture
Very Wet (Wet) Moist Damp Dry

Color (Circle major & underline modifying)
Light (Medium) Dark Olive Gray (Brown) Black Other _____

Major Constituent (Circle major & underline modifying)
Fine (Medium) Coarse Gravel (Sand) Silt Clay _____

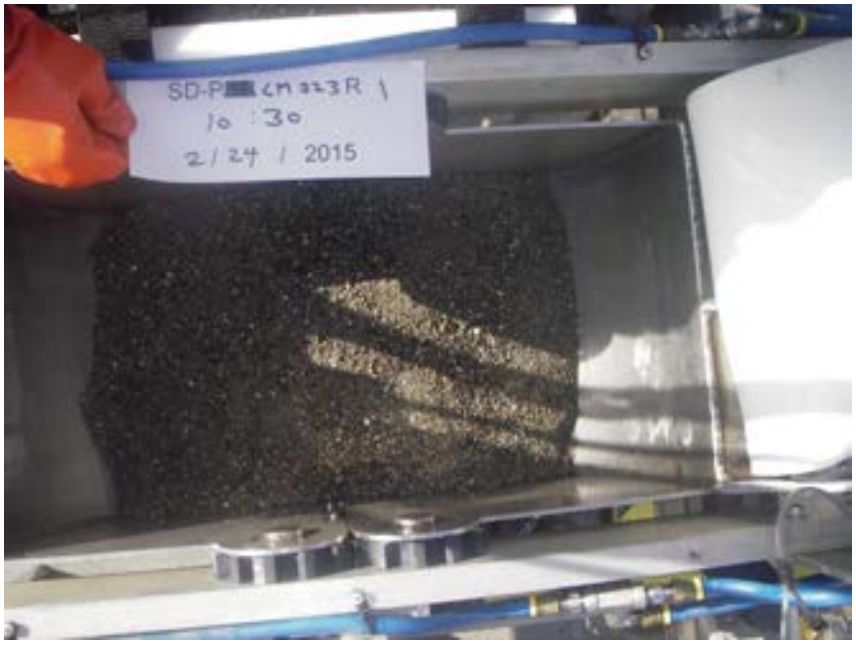
Minor Constituent with trace
(Fine) Medium Coarse Gravel (Sand) Silt Clay _____

Biological: 0 % **Debris:** 0 % **Oil Sheen:** (None) Trace (<5%) _____ %

Comments:

AmecFW Proj. BP2 PCM
SD-PCM22315 Initials: GM
QSC Form
Date: 2 / 24 /2015 Time: 1030

Amn\Field Forms\QSC



Station SD-PCM223 (Duplicate of Station SD-PCM023)

QUALITATIVE SAMPLE CHARACTERISTICS

Page ___ of ___

Coordinate Datum	Date (mm/dd/yy)	Project Location	Sample Identification Number
WA State Plane, N Zone, NAD 83, Survey Ft	2-24-15	Boeing PL2	SD-PCM 024 15

Coordinates		Water Depth				Time
North	East	Depth	Unit	Rep	Gear	
195999	1275484	8.0	f t	1	0.2 Grab	1111

Penetration Depth	Penetration Unit	Initials	Sulfide	VOA	Weather	Fines (%)
11	c m	GSM			sunny	

Surficial Wood Estimate:

Contact Points _____ X 5 = _____ %

Surficial sediment characteristics:

Biological: 0 % **Debris:** 0 % **Oil Sheen:** (None) Trace (<5%) _____ %

Moisture
Very Wet (Wet) Moist Damp Dry

Color (Circle major & underline modifying)
Light (Medium) Dark Olive Gray (Brown) Black Other _____

Major Constituent (Circle major & underline modifying)
Fine (Medium) Coarse Gravel (Sand) Silt Clay _____

Minor Constituent with trace
Fine Medium (Coarse) Gravel (Sand) Silt Clay trace fine brown sand

Subsurface sediment characteristics:

Density / Consistency

Sand / Gravel - Very Loose (Loose) Medium Dense Dense Very Dense

Silt / Clay - Very Soft Soft Medium Stiff Stiff Very Stiff Hard

Moisture
Very Wet (Wet) Moist Damp Dry

Color (Circle major & underline modifying)
Light (Medium) Dark Olive Gray (Brown) Black Other _____

Major Constituent (Circle major & underline modifying)
Fine (Medium) Coarse Gravel (Sand) Silt Clay _____

Minor Constituent with trace
Fine Medium (Coarse) Gravel (Sand) Silt Clay _____

Biological: 0 % **Debris:** 0 % **Oil Sheen:** (None) Trace (<5%) _____ %

Comments:

AmecFW Proj. BP2 PCM
SD-PCM02415 Initials: GSM
QSC Form
Date: 2 / 24 /2015 Time: 1111

AmecField Forms\QSC

Station SD-PCM024

QUALITATIVE SAMPLE CHARACTERISTICS

Page ___ of ___

Coordinate Datum	Date (mm/dd/yy)	Project Location	Sample Identification Number
WA State Plane, N Zone, NAD 83, Survey Ft	3-11-15	Boeing PL2	SD-PCM 025 15

Coordinates		Water Depth					Time
North	East	Depth	Unit		Rep	Gear	
198532	1277076	14.3	f	t	1	0.2 Grab	1126

Penetration							
Depth	Unit		Initials	Sulfide	VOA	Weather	Fines (%)
11	c	m	GSM			rain	

Surficial Wood Estimate:

Contact Points _____ X 5 = _____ %

Surficial sediment characteristics:

Biological: 0 % **Debris:** 0 % **Oil Sheen:** None Trace (<5%) _____ %

Moisture
Very Wet Wet Moist Damp Dry

Color (Circle major & underline modifying)
Light Medium Dark Olive Gray Brown Black Other _____

Major Constituent (Circle major & underline modifying)
Fine Medium Coarse Gravel Sand Silt Clay _____

Minor Constituent with trace
Fine Medium Coarse Gravel Sand Silt Clay _____

Subsurface sediment characteristics:

Density / Consistency

Sand / Gravel - Very Loose Loose Medium Dense Dense Very Dense

Silt / Clay - Very Soft Soft Medium Stiff Stiff Very Stiff Hard

Moisture
Very Wet Wet Moist Damp Dry

Color (Circle major & underline modifying)
Light Medium Dark Olive Gray Brown Black Other _____

Major Constituent (Circle major & underline modifying)
Fine Medium Coarse Gravel Sand Silt Clay _____

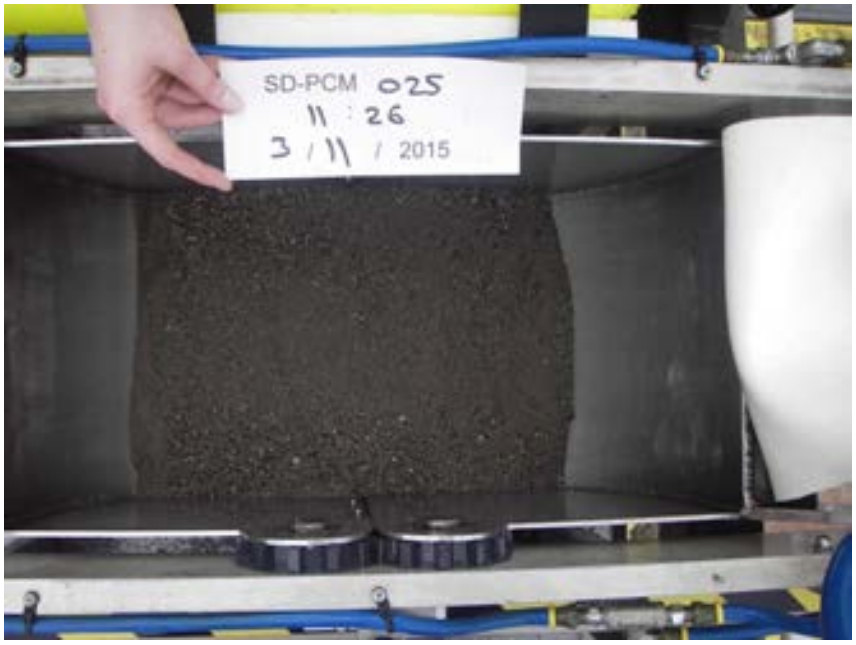
Minor Constituent with trace
Fine Medium Coarse Gravel Sand Silt Clay _____

Biological: 0 % **Debris:** 0 % **Oil Sheen:** None Trace (<5%) _____ %

Comments:
trace brown silt on surface

AmecFW Proj. BP2 PCM
SD-PCM02515 Initials: GSM
QSC Form
Date: 3 / 11 /2015 Time: 1126

AmecField Forms\QSC



Station SD-PCM025

QUALITATIVE SAMPLE CHARACTERISTICS

Page ___ of ___

Coordinate Datum	Date (mm/dd/yy)	Project Location	Sample Identification Number
WA State Plane, N Zone, NAD 83, Survey Ft	3-10-15	Boeing PL2	SD-PCM 026 15

Coordinates		Water Depth				Time
North	East	Depth	Unit	Rep	Gear	
196926	1274532	4.4	f t		0.2 Grab	1056

Penetration							
Depth	Unit	Initials	Sulfide	VOA	Weather	Fines (%)	
14	c m	GSM			p cloudy		

Surficial Wood Estimate:

Contact Points _____ X 5 = _____ %

Surficial sediment characteristics:

Biological: 0 % **Debris:** 0 % **Oil Sheen:** None Trace (<5%) _____ %

Moisture
Very Wet (Wet) Moist Damp Dry

Color **(Circle major & underline modifying)**
Light (Medium) Dark Olive Gray (Brown) Black Other _____

Major Constituent **(Circle major & underline modifying)**
Fine (Medium) Coarse Gravel (Sand) Silt Clay _____

Minor Constituent with trace
Fine Medium Coarse Gravel Sand Silt Clay _____

Subsurface sediment characteristics:

Density / Consistency

Sand / Gravel - Very Loose (Loose) Medium Dense Dense Very Dense

Silt / Clay - Very Soft Soft Medium Stiff Stiff Very Stiff Hard

Moisture
Very Wet (Wet) Moist Damp Dry

Color **(Circle major & underline modifying)**
Light (Medium) Dark Olive Gray (Brown) Black Other _____

Major Constituent **(Circle major & underline modifying)**
Fine (Medium) Coarse Gravel (Sand) Silt Clay _____

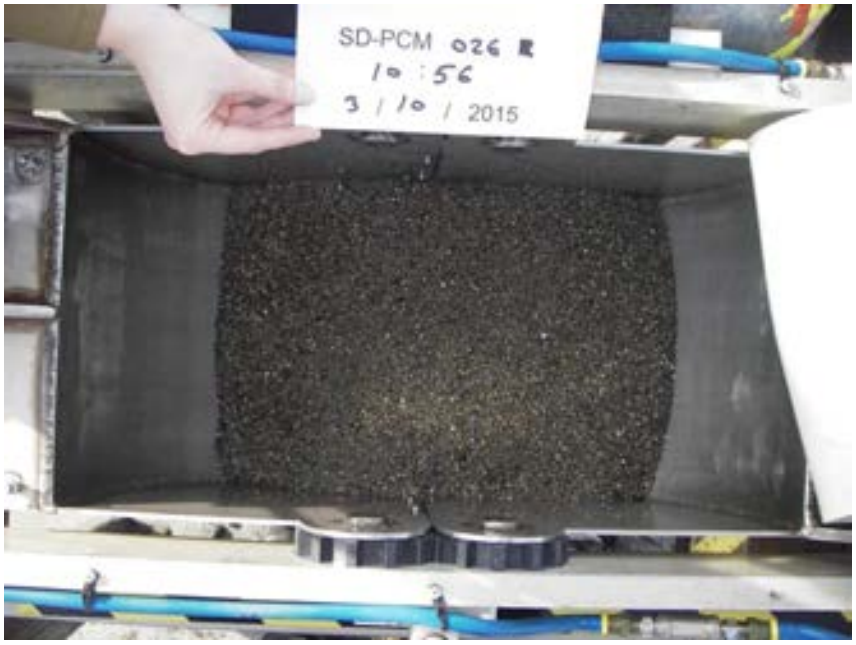
Minor Constituent with trace
(Fine) Medium Coarse Gravel (Sand) Silt Clay _____

Biological: 0 % **Debris:** 0 % **Oil Sheen:** None Trace (<5%) _____ %

Comments:

AmecFW Proj. BP2 PCM
SD-PCM02615 Initials: GSM
QSC Form
Date: 3/10/2015 Time: 1056

4/QSC



Station SD-PCM026

QUALITATIVE SAMPLE CHARACTERISTICS

Page ___ of ___

Coordinate Datum	Date (mm/dd/yy)	Project Location	Sample Identification Number
WA State Plane, N Zone, NAD 83, Survey Ft	2-25-15	Boeing PL2	SD-PCM 027 15

Coordinates		Water Depth				Time
North	East	Depth	Unit	Rep	Gear	
196555	1274768	24.8	f t	1	0.2 Grab	949

Penetration							
Depth	Unit	Initials	Sulfide	VOA	Weather	Fines (%)	
18	c m	GJM			cloudy		

Surficial Wood Estimate:

Contact Points _____ X 5 = _____ %

Surficial sediment characteristics:

Biological: 2 (crustacean) % **Debris:** 0 % **Oil Sheen:** None Trace (<5%) _____ %

Moisture
Very Wet Wet Moist Damp Dry

Color (Circle major & underline modifying)
Light Medium Dark Olive Gray Brown Black Other _____

Major Constituent (Circle major & underline modifying)
Fine Medium Coarse Gravel Sand Silt Clay _____

Minor Constituent with trace
Fine Medium Coarse Gravel Sand Silt Clay _____

Subsurface sediment characteristics:

Density / Consistency

Sand / Gravel - Very Loose Loose Medium Dense Dense Very Dense

Silt / Clay - Very Soft Soft Medium Stiff Stiff Very Stiff Hard

Moisture
Very Wet Wet Moist Damp Dry

Color (Circle major & underline modifying)
Light Medium Dark Olive Gray Brown Black Other _____

Major Constituent (Circle major & underline modifying)
Fine Medium Coarse Gravel Sand Silt Clay _____

Minor Constituent with trace
Fine Medium Coarse Gravel Sand Silt Clay _____

Biological: 0 % **Debris:** 0 % **Oil Sheen:** None Trace (<5%) _____ %

Comments:

AmecFW Proj. BP2 PCM
SD-PCM02715 Initials: GJM
QSC Form
Date: 2/25/2015 Time: 949

AmecFW, 3500 188th St. SW, Suite 601, Lynnwood, WA 98037, (425) 921-4000

Station SD-PCM027

QUALITATIVE SAMPLE CHARACTERISTICS

Page ___ of ___

Coordinate Datum	Date (mm/dd/yy)	Project Location	Sample Identification Number
WA State Plane, N Zone, NAD 83, Survey Ft	2-24-15	Boeing PL2	SD-PCM 028 15

Coordinates		Water Depth				Time
North	East	Depth	Unit	Rep	Gear	
196096	1275291	13.9	f t	1	0.2 Grab	1444

Penetration						
Depth	Unit	Initials	Sulfide	VOA	Weather	Fines (%)
13	c m	GSM			P cloudy	

Surficial Wood Estimate:

Contact Points _____ X 5 = _____ %

Surficial sediment characteristics:

Biological: 0 % **Debris:** 0 % **Oil Sheen:** None Trace (<5%) _____ %

Moisture
Very Wet Wet Moist Damp Dry

Color (Circle major & underline modifying)
Light Medium Dark Olive Gray Brown Black Other _____

Major Constituent (Circle major & underline modifying)
Fine Medium Coarse Gravel Sand Silt Clay _____

Minor Constituent with trace
Fine Medium Coarse Gravel Sand Silt Clay trace coarse gravel

Subsurface sediment characteristics:

Density / Consistency

Sand / Gravel - Very Loose Loose Medium Dense Dense Very Dense

Silt / Clay - Very Soft Soft Medium Stiff Stiff Very Stiff Hard

Moisture
Very Wet Wet Moist Damp Dry

Color (Circle major & underline modifying)
Light Medium Dark Olive Gray Brown Black Other _____

Major Constituent (Circle major & underline modifying)
Fine Medium Coarse Gravel Sand Silt Clay _____

Minor Constituent with trace
Fine Medium Coarse Gravel Sand Silt Clay _____

Biological: 0 % **Debris:** 0 % **Oil Sheen:** None Trace (<5%) _____ %

Comments:

AmecFW Proj. BP2 PCM
SD-PCM02815 Initials: GSM
QSC Form
Date: 2/24/2015 Time: 1444

Amnr\Field Forms\QSC

Station SD-PCM028

QUALITATIVE SAMPLE CHARACTERISTICS

Page ___ of ___

Coordinate Datum	Date (mm/dd/yy)	Project Location	Sample Identification Number
WA State Plane, N Zone, NAD 83, Survey Ft	2-24-15	Boeing PL2 ~~029~~	SD-PCM 029 15

Coordinates		Water Depth				Time
North	East	Depth	Unit	Rep	Gear	
195923	1275490	19.5	f t	2	0.2 Grab	1300

Penetration Depth	Penetration Unit	Initials	Sulfide	VOA	Weather	Fines (%)
8	c m	GSM			sunny	

Surficial Wood Estimate:

Contact Points _____ X 5 = _____ %

Surficial sediment characteristics:

Biological: 0 % **Debris:** 0 % **Oil Sheen:** None Trace (<5%) 0 %

Moisture
Very Wet | Wet | Moist | Damp | Dry

Color (Circle major & underline modifying)
Light | Medium | Dark | Olive | Gray | Brown | Black | Other _____

Major Constituent (Circle major & underline modifying)
Fine | Medium | Coarse | Gravel | Sand | Silt | Clay _____

Minor Constituent with trace
Fine | Medium | Coarse | Gravel | Sand | Silt | Clay _____

Subsurface sediment characteristics:

Density / Consistency

Sand / Gravel - Very Loose | Loose | Medium Dense | Dense | Very Dense

Silt / Clay - Very Soft | Soft | Medium Stiff | Stiff | Very Stiff | Hard

Moisture
Very Wet | Wet | Moist | Damp | Dry

Color (Circle major & underline modifying)
Light | Medium | Dark | Olive | Gray | Brown | Black | Other _____

Major Constituent (Circle major & underline modifying)
Fine | Medium | Coarse | Gravel | Sand | Silt | Clay _____

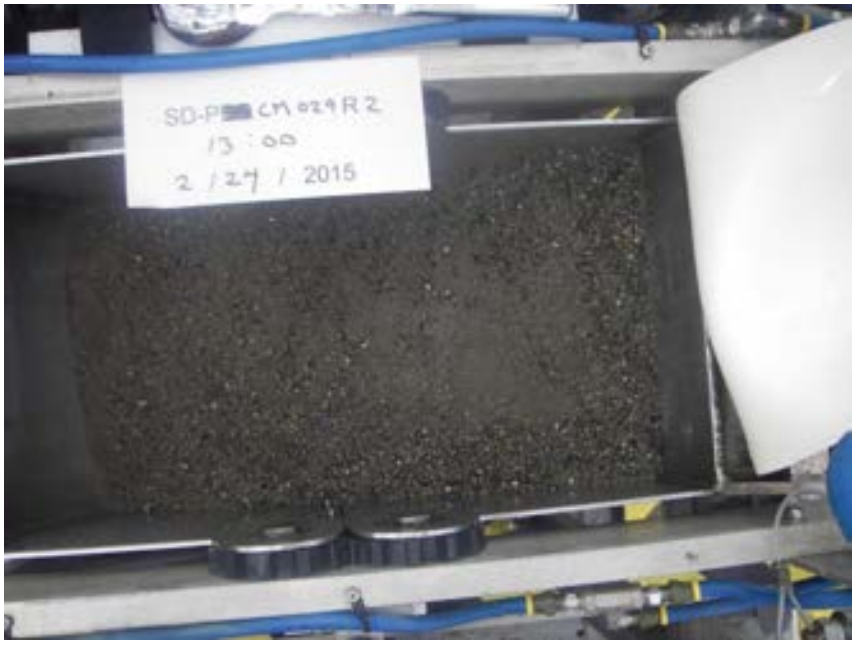
Minor Constituent with trace
Fine | Medium | Coarse | Gravel | Sand | Silt | Clay _____

Biological: 0 % **Debris:** 0 % **Oil Sheen:** None Trace (<5%) _____ %

Comments: R1 - reject - off station

AmecFW Proj. BP2 PCM
SD-PCM02915 Initials: GSM
QSC Form
Date: 2 / 24 /2015 Time: 1300

AmnField Forms\QSC



Station SD-PCM029

QUALITATIVE SAMPLE CHARACTERISTICS

Page ___ of ___

Coordinate Datum	Date (mm/dd/yy)	Project Location	Sample Identification Number
WA State Plane, N Zone, NAD 83, Survey Ft	2-25-15	Boeing PL2	SD-PCM 030 15

Coordinates		Water Depth					Time
North	East	Depth	Unit		Rep	Gear	
195748	1275656	25.6	f	t	1	0.2 Grab	1024

Penetration						
Depth	Unit	Initials	Sulfide	VOA	Weather	Fines (%)
20	c m	BSM			Cloudy	

Surficial Wood Estimate:

Contact Points _____ X 5 = _____ %

Surficial sediment characteristics:

Biological: 0 % **Debris:** 0 % **Oil Sheen:** (None) Trace (<5%) _____ %

Moisture
Very Wet (Wet) Moist Damp Dry

Color **(Circle major & underline modifying)**
Light (Medium) Dark (Olive) Gray (Brown) Black Other _____

Major Constituent **(Circle major & underline modifying)**
(Fine) Medium Coarse Gravel Sand (Silt) Clay _____

Minor Constituent with trace
Fine (Medium) Coarse Gravel (Sand) Silt Clay _____

Subsurface sediment characteristics:

Density / Consistency

Sand / Gravel - Very Loose (Loose) Medium Dense Dense Very Dense

Silt / Clay - Very Soft Soft Medium Stiff Stiff Very Stiff Hard

Moisture
Very Wet (Wet) Moist Damp Dry

Color **(Circle major & underline modifying)**
Light (Medium) Dark Olive Gray (Brown) Black Other _____

Major Constituent **(Circle major & underline modifying)**
Fine (Medium) Coarse Gravel (Sand) Silt Clay _____

Minor Constituent with trace
Fine Medium (Coarse) Gravel (Sand) Silt Clay _____

Biological: 0 % **Debris:** 0 % **Oil Sheen:** (None) Trace (<5%) _____ %

Comments:
2-3 cm of silt on surface

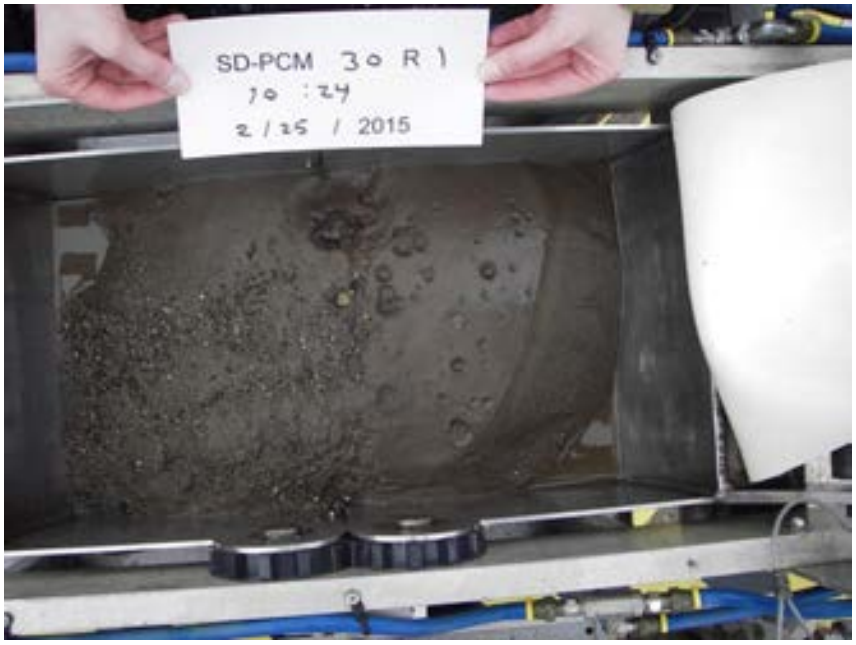
AmecFW Proj. BP2 PCM

SD-PCM03015 Initials: BSM

QSC Form

Date: 2/25/2015 Time: 1024

AmnField Forms\QSC



Station SD-PCM030

QUALITATIVE SAMPLE CHARACTERISTICS

Page ____ of ____

Coordinate Datum	Date (mm/dd/yy)	Project Location	Sample Identification Number
WA State Plane, N Zone, NAD 83, Survey Ft	3-12-15	Boeing PL2	SD-PCM 31 15

Coordinates		Water Depth					
North	East	Depth	Unit	Rep	Gear	Time
138281	1273065	0	f t	1	~~0.2 Grab~~ ponar	1320

Penetration		Initials	Sulfide	VOA	Weather	Fines (%)
Depth	Unit					
	c m	GSM			P cloudy	

Surficial Wood Estimate:

Contact Points ________ X 5 = ________ %

Surficial sediment characteristics:

Biological: 0 % **Debris:** matting 50 % **Oil Sheen:** (None) Trace (<5%) ____ %

Moisture
Very Wet (Wet) Moist Damp Dry

Color (Circle major & underline modifying)
Light (Medium) Dark Olive Gray (Brown) Black Other ________

Major Constituent (Circle major & underline modifying)
(Fine) Medium Coarse Gravel Sand (Silt) Clay ________

Minor Constituent with trace
Fine Medium Coarse Gravel Sand Silt Clay ________

Subsurface sediment characteristics:

Density / Consistency

Sand / Gravel - Very Loose Loose Medium Dense Dense Very Dense

Silt / Clay - Very Soft Soft (Medium Stiff) Stiff Very Stiff Hard

Moisture
Very Wet (Wet) Moist Damp Dry

Color (Circle major & underline modifying)
Light Medium (Dark) Olive Gray (Brown) Black Other ________

Major Constituent (Circle major & underline modifying)
(Fine) Medium Coarse Gravel Sand (Silt) Clay ________

Minor Constituent with trace
(Fine) Medium Coarse Gravel Sand Silt Clay ________

Biological: 0 % **Debris:** 10 % **Oil Sheen:** (None) Trace (<5%) ____ %

Comments:
multibed - sm 683 as prev 232

AmecFW Proj. BP2 PCM
SD-PCM03115 Initials: GSM
QSC Form
Date: 3 / 12 /2015 Time: 1320

Station SD-PCM031

QUALITATIVE SAMPLE CHARACTERISTICS

Page ___ of ___

Coordinate Datum	Date (mm/dd/yy)	Project Location	Sample Identification Number
WA State Plane, N Zone, NAD 83, Survey Ft	3-12-15	Boeing PL2	SD-PCM 32 15

Coordinates		Water Depth					Time
North	East	Depth	Unit		Rep	Gear	
198 272	1273156	2	f	t	1	0.2 ~~Grab~~	1300

Penetration			Initials	Sulfide	VOA	Weather	Fines (%)
Depth	Unit						
	c	m	GSM			sunny	

Surficial Wood Estimate: spars

Contact Points _____ X 5 = _____ %

Surficial sediment characteristics:

Biological: 2 % **Debris:** leaves <1 % **Oil Sheen:** (None) Trace (<5%) _____ %

Moisture
Very Wet (Wet) Moist Damp Dry

Color (Circle major & underline modifying)
Light (Medium) Dark Olive Gray (Brown) Black Other orange

Major Constituent (Circle major & underline modifying)
(Fine) Medium Coarse Gravel Sand (Silt) Clay _____

Minor Constituent with trace
Fine Medium Coarse Gravel Sand Silt Clay _____

Subsurface sediment characteristics:

Density / Consistency

Sand / Gravel - Very Loose Loose Medium Dense Dense Very Dense

Silt / Clay - (Very Soft) Soft Medium Stiff Stiff Very Stiff Hard

Moisture
(~~Very Wet~~) Wet Moist Damp Dry

Color (Circle major & underline modifying)
Light Medium Dark Olive Gray Brown (Black) Other _____

Major Constituent (Circle major & underline modifying)
(Fine) Medium Coarse Gravel Sand (Silt) Clay _____

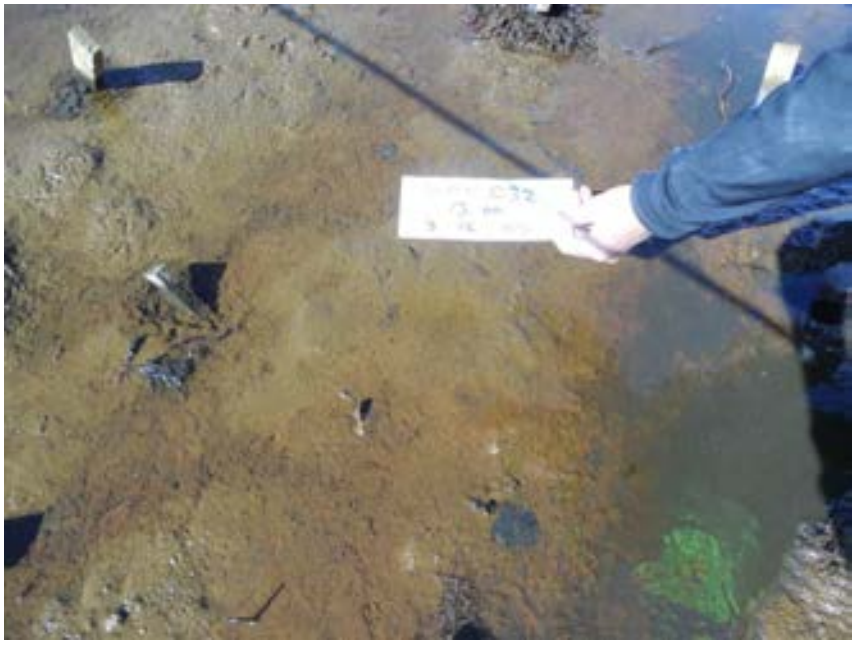
Minor Constituent with trace
Fine Medium Coarse Gravel Sand Silt Clay _____

Biological: 0 % **Debris:** nothing 5 % **Oil Sheen:** (None) Trace (<5%) _____ %

Comments:

AmecFW Prcj. CI 2 FLM
SD-PCM03215 Initials: ___
QSC Form
Date: 3/12/2015 Time: ___

AmecFW, 3500 188th St. SW, Suite 601, Lynnwood, WA 98037, (425) 921-4000



Station SD-PCM032

QUALITATIVE SAMPLE CHARACTERISTICS

Page ___ of ___

Coordinate Datum	Date (mm/dd/yy)	Project Location	Sample Identification Number
WA State Plane, N Zone, NAD 83, Survey Ft	3-12-15	Boeing PL2	SD-PCM 33 15

Coordinates		Water Depth					Time
North	East	Depth	Unit		Rep	Gear	
197991	1273298	9	f	t	1	~~0.2 Grab~~ Spoon	1345

Penetration							
Depth	Unit	Initials	Sulfide	VOA	Weather	Fines (%)	
	c m	CSM			Sunny		

Surficial Wood Estimate:

Contact Points _____ X 5 = _____ %

Surficial sediment characteristics:

Biological: 0 % **Debris:** 0 % **Oil Sheen:** None Trace (<5%) _____ %

Moisture
Very Wet Wet Moist Damp Dry

Color (Circle major & underline modifying)
Light Medium Dark Olive Gray Brown Black Other _____

Major Constituent (Circle major & underline modifying)
Fine Medium Coarse Gravel Sand Silt Clay _____

Minor Constituent with trace
Fine Medium Coarse Gravel Sand Silt Clay _____

Subsurface sediment characteristics:

Density / Consistency

Sand / Gravel - Very Loose Loose Medium Dense Dense Very Dense

Silt / Clay - Very Soft Soft Medium Stiff Stiff Very Stiff Hard

Moisture
Very Wet Wet Moist Damp Dry

Color (Circle major & underline modifying)
Light Medium Dark Olive Gray Brown Black Other _____

Major Constituent (Circle major & underline modifying)
Fine Medium Coarse Gravel Sand Silt Clay _____

Minor Constituent with trace
Fine Medium Coarse Gravel Sand Silt Clay _____

Biological: 0 % **Debris:** _____ % **Oil Sheen:** None Trace (<5%) _____ %

Comments:

AmecFW Proj. BP2 PCM

SD-PCM03315 Initials: ___

QSC Form

Date: 3 / 12 /2015 Time: 13-3

Amn\Field Forms\QSC

Station SD-PCM033

QUALITATIVE SAMPLE CHARACTERISTICS

Page ___ of ___

Coordinate Datum	Date (mm/dd/yy)	Project Location	Sample Identification Number
WA State Plane, N Zone, NAD 83, Survey Ft	3-12-15	Boeing PL2	SD-PCM 34 15

Coordinates		Water Depth					Time
North	East	Depth	Unit		Rep	Gear	
196440	1275180	0	f	t	1	~~0.2 Grab~~	1544

Penetration							
Depth	Unit	Initials	Sulfide	VOA	Weather	Fines (%)	
10	c m	ESN			P cloudy		

Surficial Wood Estimate: 10%

Contact Points _____ X 5 = _____ %

Surficial sediment characteristics:

Biological: 0 % **Debris:** 0 % **Oil Sheen:** (None) Trace (<5%) _____ %

Moisture
Very Wet Wet (Moist) Damp Dry

Color (Circle major & underline modifying)
Light (Medium) Dark Olive (Gray) Brown Black Other _____

Major Constituent (Circle major & underline modifying)
(Fine) Medium Coarse Gravel (Sand) Silt Clay _____

Minor Constituent with trace
Fine Medium Coarse Gravel Sand Silt Clay _____

Subsurface sediment characteristics:

Density / Consistency

Sand / Gravel - Very Loose Loose (Medium Dense) Dense Very Dense

Silt / Clay - Very Soft Soft Medium Stiff Stiff Very Stiff Hard

Moisture
Very Wet Wet (Moist) Damp Dry

Color (Circle major & underline modifying)
Light Medium (Dark) Olive Gray (Brown) Black Other _____

Major Constituent (Circle major & underline modifying)
(Fine) Medium Coarse Gravel (Sand) Silt Clay _____

Minor Constituent with trace
(Fine) Medium Coarse Gravel Sand (Silt) Clay _____

Biological: 0 % **Debris:** wood chips <1 % **Oil Sheen:** (None) Trace (<5%) _____ %

Comments:

AmecFW Proj. BP2 PCM
SD-PCM03415 Initials: _____
QSC Form
Date: 3/12/2015 Time: 1544

AmecFW, 3500 188th St. SW, Suite 601, Lynnwood, WA 98037, (425) 921-4000

Station SD-PCM034

QUALITATIVE SAMPLE CHARACTERISTICS

Page ___ of ___

Coordinate Datum	Date (mm/dd/yy)	Project Location	Sample Identification Number
WA State Plane, N Zone, NAD 83, Survey Ft	3-12-15	Boeing PL2	SD-PCM 35 15

Coordinates		Water Depth				Time
19□324 North	East	Depth	Unit	Rep	Gear	
196325	1275310	9	f t	1	~~0.2 Grab~~	1532

Penetration Depth	Penetration Unit	Initials	Sulfide	VOA	Weather	Fines (%)
15	c m	ESH			Sunny	

Surficial Wood Estimate: Sparse

Contact Points _____ X 5 = _____ %

Surficial sediment characteristics:

Biological: 0 % **Debris:** wood chips <1 % **Oil Sheen:** (None) Trace (<5%) _____ %

Moisture
Very Wet Wet (Moist) Damp Dry

Color (Circle major & underline modifying)
Light (Medium) Dark Olive (Gray) Brown Black Other _____

Major Constituent (Circle major & underline modifying)
(Fine) Medium Coarse Gravel (Sand) Silt Clay _____

Minor Constituent with trace
Fine (Medium) Coarse Gravel (Sand) Silt Clay _____

Subsurface sediment characteristics:

Density / Consistency

Sand / Gravel - Very Loose Loose (Medium Dense) Dense Very Dense

Silt / Clay - Very Soft Soft Medium Stiff Stiff Very Stiff Hard

Moisture
Very Wet Wet (Moist) Damp Dry

Color (Circle major & underline modifying)
Light Medium (Dark) Olive (Gray) Brown (Black) Other _____

Major Constituent (Circle major & underline modifying)
(Fine) Medium Coarse Gravel (Sand) Silt Clay _____

Minor Constituent with trace
(Fine) Medium Coarse Gravel Sand (Silt) Clay _____

Biological: 0 % **Debris:** mitting 10 % **Oil Sheen:** (None) Trace (<5%) _____ %

Comments:

AmecFW Proj. BP2 PCM
SD-PCM03515 Initials: ESH
QSC Form
Date: 3/12/2015 Time: 1532

AmecFW, 3500 188th St. SW, Suite 601, Lynnwood, WA 98037, (425) 921-4000

Station SD-PCM035

QUALITATIVE SAMPLE CHARACTERISTICS

Page ___ of ___

Coordinate Datum	Date (mm/dd/yy)	Project Location	Sample Identification Number
WA State Plane, N Zone, NAD 83, Survey Ft	3-12-15	Boeing PL2	SD-PCM 36 15

Coordinates		Water Depth					Time
North	East	Depth	Unit		Rep	Gear	
195921	1275635	0	f	t	1	~~0.2 Grab~~ Spoon	1519

Penetration							
Depth	Unit	Initials	Sulfide	VOA	Weather	Fines (%)	
10	c m	GSM			Sunny		

Surficial Wood Estimate:

Contact Points _____ X 5 = _____ %

Surficial sediment characteristics:

Biological: 0 % **Debris:** wood chunks matting <1 % **Oil Sheen:** (None) Trace (<5%) _____ %

Moisture
Very Wet Wet (Moist) Damp Dry

Color (Circle major & underline modifying)
Light (Medium) Dark Olive (Gray) Brown Black Other _____

Major Constituent (Circle major & underline modifying)
(Fine) Medium Coarse Gravel (Sand) Silt Clay _____

Minor Constituent with trace
Fine Medium (Coarse) Gravel (Sand) Silt Clay _____

Subsurface sediment characteristics:

Density / Consistency

Sand / Gravel - Very Loose (Loose) Medium Dense Dense Very Dense

Silt / Clay - Very Soft Soft Medium Stiff Stiff Very Stiff Hard

Moisture
Very Wet Wet (Moist) Damp Dry

Color (Circle major & underline modifying)
Light Medium (Dark) Olive (Gray) Brown Black Other _____

Major Constituent (Circle major & underline modifying)
(Fine) Medium Coarse Gravel (Sand) Silt Clay _____

Minor Constituent with trace
Fine Medium (Coarse) (Gravel) Sand Silt Clay _____

Biological: 0 % **Debris:** matting 10 % **Oil Sheen:** (None) Trace (<5%) _____ %

Comments:

AmecFW Proj. BP2 PCM
SD-PCM03615 Initials: GSM
QSC Form
Date: 3 / 12 /2015 Time: 1519

AmecFW, 3500 188th St. SW, Suite 601, Lynnwood, WA 98037, (425) 921-4000

Station SD-PCM036

ATTACHMENT B

Chain-of-Custody Forms

Amec Foster Wheeler
3500 188th St. SW, Suite 601
Lynnwood,WA 98037
(425) 921-4000

CHAIN OF CUSTODY

AmecFW Proj. BP2 PCM
Post Construction Monitoring YR 2015
COC Number 001

Recorded by: GSM
Checked by: _____

		Analysis Containers			
		SMS COCs-Full List (Metals, SVOAs, SIM, PCBs) and TOC (1-L Glass)	Grain size (PSEP) (16-oz Plastic)	Dioxin/Furans (8-oz Amber)	Number of containers
AmecFW Proj. BP2 PCM SD-PCM01715 Initials: GSM COC Form Date: 2/24/2015 Time: 913	Date: Time:	1			1
AmecFW Proj. BP2 PCM SD-PCM00715 Initials: GSM COC Form Date: 2/24/2015 Time: 942	Date: Time:	1	1		2
AmecFW Proj. BP2 PCM SD-PCM02315 Initials: GSM SD-PCM02315 COC Form Date: 2/24/2015 Time: 1016	Date: Time:	1			1
AmecFW Proj. BP2 PCM SD-PCM22315 Initials: GSM COC Form Date: 2/24/2015 Time: 1030	Date: Time:	1			1
AmecFW Proj. BP2 PCM SD-PCM00815 Initials: GSM COC Form Date: 2/24/2015 Time: 1051	Date: Time:	1		1	2
AmecFW Proj. BP2 PCM SD-PCM02415 Initials: GSM COC Form Date: 2/24/2015 Time:	Date: Time:	1			1
AmecFW Proj. BP2 PCM SD-PCM01815 Initials: GSM COC Form Date: 2/24/2015 Time: 1132	Date: Time:	1	1		2

Laboratory Sample Receipt

ARI Project Manager—Kelly Bottem
AMEC Project Manager—Cliff Whitmus (cliff whitmus@amecfw com ph 425-921-4023)
AMEC Laboratory Coordinator—Crystal Neirby (crystal neirby@amecfw.com ph. 206-838-8469)

Sediment samples in 1-L glass jars are unhomogenized. Samples material in 1-liter jars must be thoroughly homogenized before analysis Dioxin (8-oz Amber) and GS (16-oz plastic) samples are homogenized.

Relinquished By	Received By
Name: Gary Maxwell	Name: Chris Ansell
Date: 2-24-15	Date: 2-24-15
Time: 1600	Time: 1600

Amec Foster Wheeler
3500 188th St. SW, Suite 601
Lynnwood,WA 98037
(425) 921-4000

CHAIN OF CUSTODY

AmecFW Proj. BP2 PCM
Post Construction Monitoring YR 2015
COC Number 002

Recorded by: GSM
Checked by: KJK

	Date/Time	Analysis Containers: SMS COCs-Full List (Metals, SVOAs, SIM, PCBs) and TOC (1-L Glass)	Grain size (PSEP) (16-oz Plastic)	Dioxin/Furans (8-oz Amber)	Number of containers
AmecFW Proj. BP2 PCM SD-PCM21815 Initials: GSM COC Form Date: 2/24/2015 Time: 1145	Date: Time:	1			1
AmecFW Proj. BP2 PCM SD-PCM02915 Initials: GSM COC Form Date: 2/24/2015 Time: 1300	Date: Time:	1			1
AmecFW Proj. BP2 PCM SD-PCM02815 Initials: GSM COC Form Date: 2/24/2015 Time: 1444	Date: Time:	1			1
AmecFW Proj. BP2 PCM SD-PCM01915 Initials: GSM COC Form Date: 2/24/2015 Time: 1501	Date: Time:	1		1	2
Place Sample ID Label Here or Write ID Number Here	Date: Time:				Number of containers
Place Sample ID Label Here or Write ID Number Here	Date: Time:				Number of containers
Place Sample ID Label Here or Write ID Number Here	Date: Time:				Number of containers

Laboratory Sample Receipt

ARI Project Manager—Kelly Bottem
AMEC Project Manager—Cliff Whitmus (cliff.whitmus@amecfw com ph 425-921-4023)
AMEC Laboratory Coordinator—Crystal Neirby (crystal.neirby@amecfw.com ph. 206-838-8469)

Sediment samples in 1-L glass jars are unhomogenized Samples material in 1-liter jars must be thoroughly homogenized before analysis. Dioxin (8-oz Amber) and GS (16-oz plastic) samples are homogenized.

Relinquished By	Received By
Name: Gary Maxwell	Name: Chris Ahrens
Date: 2-24-15	Date: 2-24-15
Time: 1600	Time: 1600

Amec Foster Wheeler
3500 188th St. SW, Suite 601
Lynnwood,WA 98037
(425) 921-4000

CHAIN OF CUSTODY

AmecFW Proj. BP2 PCM
Post Construction Monitoring YR 2015
COC Number 003

Recorded by: GSM
Checked by: _____

		Analysis Containers			
		SMS COCs-Full List (Metals, SVOAs, SIM, PCBs) and TOC (1-L Glass)	Grain size (PSEP) (16-oz Plastic)	Dioxin/Furans (8-oz Amber)	
AmecFW Proj. BP2 PCM SD-PCM02715 Initials: GSM COC Form Date: 2/25/2015 Time: 949	Date: Time:	1			Number of containers: 1
AmecFW Proj. BP2 PCM SD-PCM03015 Initials: GSM COC Form Date: 2/25/2015 Time: 1024	Date: Time:	1			Number of containers: 1
AmecFW Proj. BP2 PCM SD-PCM00915 Initials: GSM COC Form Date: 2/25/2015 Time: 1045	Date: Time:	1			Number of containers: 1
Place Sample ID Label Here or Write ID Number Here	Date: Time:				Number of containers:
Place Sample ID Label Here or Write ID Number Here	Date: Time:				Number of containers:
Place Sample ID Label Here or Write ID Number Here	Date: Time:				Number of containers:
Place Sample ID Label Here or Write ID Number Here	Date: Time:				Number of containers:

Laboratory Sample Receipt

ARI Project Manager—Kelly Bottem
AMEC Project Manager—Cliff Whitmus (cliff.whitmus@amecfw.com ph 425-921-4023)
AMEC Laboratory Coordinator—Crystal Neirby (crystal.neirby@amecfw.com ph. 206-838-8469)

Sediment samples in 1-L glass jars are unhomogenized. Samples material in 1-liter jars *must be thoroughly* homogenized before analysis. Dioxin (8-oz Amber) and GS (16-oz plastic) samples are homogenized.

Relinquished By	Received By
Name: Gary Maxwell	Name:
Date: 2-25-15	Date: 2/25/15
Time: 1601	Time: 1601

Amec Foster Wheeler
3500 188th St. SW, Suite 601
Lynnwood,WA 98037
(425) 921-4000

ZZ74

CHAIN OF CUSTODY

AmecFW Proj. BP2 PCM
Post Construction Monitoring YR 2015
COC Number 004

Recorded by: GSM
Checked by: _____

	Analysis Containers			
	SMS COCs-Full List (Metals, SVOAs, SIM, PCBs) and TOC (1-L Glass)	Grain size (PSEP) (16-oz Plastic)	Dioxin/Furans (8-oz Amber)	Number of containers
AmecFW Proj. BP2 PCM SD-PCM01615 Initials: GSM COC Form Date: 3/10/2015 Time: 1003	1			1
AmecFW Proj. BP2 PCM SD-PCM00615 Initials: GSM COC Form Date: 3/10/2015 Time: 1022	1			1
AmecFW Proj. BP2 PCM SD-PCM20615 Initials: GSM COC Form Date: 3/10/2015 Time: 1036	1			1
AmecFW Proj. BP2 PCM SD-PCM02615 Initials: GSM COC Form Date: 3/10/2015 Time: 1056	1			1
AmecFW Proj. BP2 PCM SD-PCM02215 Initials: GSM COC Form Date: 3/10/2015 Time: 1115	1			1
AmecFW Proj. BP2 PCM SD-PCM00515 Initials: GSM COC Form Date: 3/10/2015 Time: 1246	1	1		2
AmecFW Proj. BP2 PCM SD-PCM01415 Initials: GSM COC Form Date: 3/10/2015 Time: 1305	1	1		2

ARI Project Manager—Kelly Bottem
AMEC Project Manager—Cliff Whitmus (cliff.whitmus@amecfw.com ph. 425-921-4023)
AMEC Laboratory Coordinator—Crystal Neirby (crystal.neirby@amecfw.com ph. 206-838-8469)

Sediment samples in 1-L glass jars are unhomogenized. Samples material in 1-liter jars must be thoroughly homogenized before analysis. Dioxin (8-oz Amber) and GS (16-oz plastic) samples are homogenized.

Relinquished By	Received By
Name: Greg Maxwell	Name:
Date: 3-10-15	Date: 3/10/15
Time: 1523	Time: 1503

Admin\Field Forms\COC

ZZ74 : 00003

Amec Foster Wheeler
3500 188th St. SW, Suite 601
Lynnwood,WA 98037
(425) 921-4000

CHAIN OF CUSTODY

AmecFW Proj. BP2 PCM

Post Construction Monitoring YR 2015

COC Number 005

Recorded by: GSM

Checked by: _____

		Analysis Containers			
		SMS COCs-Full List (Metals, SVOAs, SIM, PCBs) and TOC (1-L Glass)	Grain size (PSEP) (16-oz Plastic)	Dioxin/Furans (8-oz Amber)	
AmecFW Proj. BP2 PCM SD-PCM00215 Initials: GSM COC Form Date: 3/10/2015 Time: 1323	Date: Time:	1	1		Number of containers: 2
AmecFW Proj. BP2 PCM SD-PCM01115 Initials: GSM COC Form Date: 3/11/2015 Time: 1341	Date: Time:	1	1		Number of containers: 2
AmecFW Proj. BP2 PCM SD-PCM01315 Initials: GSM COC Form Date: 3/10/2015 Time: 1412	Date: Time:	1			Number of containers: 1
Place Sample ID Label Here or Write ID Number Here	Date: Time:				Number of containers:
Place Sample ID Label Here or Write ID Number Here	Date: Time:				Number of containers:
Place Sample ID Label Here or Write ID Number Here	Date: Time:				Number of containers:
Place Sample ID Label Here or Write ID Number Here	Date: Time:				Number of containers:

Laboratory Sample Receipt

ARI Project Manager—Kelly Bottem
AMEC Project Manager—Cliff Whitmus (cliff.whitmus@amecfw.com ph 425-921-4023)
AMEC Laboratory Coordinator—Crystal Neirby (crystal.neirby@amecfw.com ph. 206-838-8469)

Sediment samples in 1-L glass jars are unhomogenized. Samples material in 1-liter jars must be thoroughly homogenized before analysis. Dioxin (8-oz Amber) and GS (16-oz plastic) samples are homogenized.

Relinquished By	Received By
Name: Gary Maxwell 3-10-15	Name:
Date: 3-10-15	Date: 3/10/15
Time: 1529	Time: 1524

Admin\Field Forms\COC

Amec Foster Wheeler
3500 188th St SW, Suite 601
Lynnwood,WA 98037
(425) 921-4000

CHAIN OF CUSTODY

AmecFW Proj. BP2 PCM
Post Construction Monitoring YR 2015
COC Number 006

Recorded by: GSM
Checked by: _____

	Date / Time	Analysis Containers: SMS COCs-Full List (Metals, SVOAs, SIM, PCBs) and TOC (1-L Glass)	Grain size (PSEP) (16-oz Plastic)	Dioxin/Furans (8-oz Amber)	Number of containers
AmecFW Proj. BP2 PCM SD-PCM01515 Initials: GSM COC Form Date: 3/11/2015 Time: 8:49	Date. Time	1		1	2
AmecFW Proj. BP2 PCM SD-PCM00415 Initials: GSM COC Form Date: 3/11/2015 Time: 912	Date: Time	1		1	2
AmecFW Proj. BP2 PCM SD-PCM00315 Initials: GSM COC Form Date: 3/11/2015 Time: 925	Date. Time	1			1
AmecFW Proj. BP2 PCM SD-PCM01215 Initials: GSM COC Form Date: 3/11/2015 Time: 944	Date Time:	1			1
AmecFW Proj BP2 PCM SD-PCM21215 Initials: GSM COC Form Date: 3/11/2015 Time: 956	Date me.	1			1
AmecFW Proj. BP2 PCM SD-PCM00115 Initials: GSM COC Form Date: 3/11/2015 Time: 1009	ite Time.	1		1	2
AmecFW Proj. BP2 PCM SD-PCM02115 Initials GSM COC Form Date: 3/11/2015 Time: 1025	Date Time	1			1

ARI Project Manager—Kelly Bottem
AMEC Project Manager—Cliff Whitmus (cliff.whitmus@amecfw.com ph 425-921-4023)
AMEC Laboratory Coordinator—Crystal Nerby (crystal nerby@amecfw com ph 206-838-8469)

Sediment samples in 1-L glass jars are unhomogenized Samples material in 1-liter jars must be thoroughly homogenized before analysis Dioxin (8-oz Amber) and GS (16-oz plastic) samples are homogenized

Relinquished By	Received By
Name: Gary Maxwell	Name:
Date: 3-11-15	Date: 3/11/15
Time: 1550	Time: 1550

Amec Foster Wheeler
3500 188th St. SW, Suite 601
Lynnwood,WA 98037
(425) 921-4000

CHAIN OF CUSTODY

AmecFW Proj. BP2 PCM
Post Construction Monitoring YR 2015
COC Number 007

Recorded by GSM
Checked by: _____

		Analysis Containers: SMS COCs-Full List (Metals, SVOAs, SIM, PCBs) and TOC (1-L Glass)	Analysis Containers: Grain size (PSEP) (16-oz Plastic)	Analysis Containers: Dioxin/Furans (8-oz Amber)	
AmecFW Proj. BP2 PCM SD-PCM02015 Initials: GSM COC Form Date 3/11/2015 Time: 1017	Date Time	1			Number of containers: 1
AmecFW Proj. BP2 PCM SD-PCM02515 Initials: GSM COC Form Date: 3/11/2015 Time: 1120	Date Time	1			Number of containers: 1
AmecFW Proj. BP2 PCM SD-PCM01015 Initials: GSM COC Form Date: 3/11/2015 Time: 1139	Date Time	1		1	Number of containers: 2
Place Sample ID Label Here or Write ID Number Here	Date Time:				Number of containers
Place Sample ID Label Here or Write ID Number Here	Date Time				Number of containers
Place Sample ID Label Here or Write ID Number Here	Date Time				Number of containers
Place Sample ID Label Here or Write ID Number Here	Date Time				Number of containers

Laboratory Sample Receipt

ARI Project Manager—Kelly Bottem
AMEC Project Manager—Cliff Whitmus (cliff whitmus@amecfw com ph 425-921-4023)
AMEC Laboratory Coordinator—Crystal Neirby (crystal.neirby@amecfw.com ph 206-838-8469)

Sediment samples in 1-L glass jars are unhomogenized Samples material in 1-liter jars must be thoroughly homogenized before analysis Dioxin (8-oz Amber) and GS (16-oz plastic) samples are homogenized

Relinquished By	Received By
Name: Gary Maxwell	Name:
Date: 3-26-15	Date: 3/11/15
Time: 1550	Time: 1550

Amec Foster Wheeler
3500 188th St. SW, Suite 601
Lynnwood,WA 98037
(425) 921-4000

CHAIN OF CUSTODY

Place Sample ID Label Here
or Write ID Number Here

Recorded by: GSM

Checked by: _____

		Analysis Containers			
		SMS COCs-Full List (Metals, SVOAs, SIM, PCBs) and TOC (1-L Glass)	Grain size (PSEP) (16-oz Plastic)	Dioxin/Furans (8-oz Amber)	
AmecFW Proj. BP2 PCM SD-PCM03215 Initials:_____ COC Form Date: 3 / 12 /2015 Time: 13:00	Date: Time:	1			Number of containers: 1
AmecFW Proj. BP2 PCM SD-PCM03115 Initials: GSM COC Form Date: 3 / 12 /2015 Time: 13:20	Date: Time:	1			Number of containers: 1
AmecFW Proj. BP2 PCM SD-PCM03315 Initials: _____ COC Form Date: _____ / 12 /2015 Time: 13:45	Date: Time:	1			Number of containers: 1
AmecFW Proj. BP2 PCM SD-PCM03615 Initials: GSM COC Form Date: _____ / 12 /2015 Time: 15:90	Date: Time:	1			Number of containers: 1
AmecFW Proj. BP2 PCM SD-PCM03515 Initials: _____ COC Form 15:32 Date: 3 / 12 /2015 Time: _____	Date: Time:	1			Number of containers: 1
AmecFW Proj. BP2 PCM SD-PCM03415 Initials:_____ COC Form 15:44 Date: _____ / _____ /2015 Time:_____	Date: Time:	1			Number of containers: 1
or Write ID Number Here	Date: Time:				Number of containers:

Laboratory Sample Receipt

ARI Project Manager—Kelly Bottem
AMEC Project Manager—Cliff Whitmus (cliff.whitmus@amecfw.com ph 425-921-4023)
AMEC Laboratory Coordinator—Crystal Neirby (crystal.neirby@amecfw.com ph. 206-838-8469)

Sediment samples in 1-L glass jars are unhomogenized. Samples material in 1-liter jars must be thoroughly homogenized before analysis. Dioxin (8-oz Amber) and GS (16-oz plastic) samples are homogenized

Relinquished By	Received By
Name: Gary Maxwell	Name:
Date: 3-12-15	Date: 3/12/15
Time: 1619	Time: 1619

ATTACHMENT C

Data Validation Report

Sayler Data Solutions, Inc.
14257 93rd Court NE Kirkland, Washington 98034 (425) 820-7504 cari@saylerdata.com

DATA VALIDATION REPORT

Boeing Plant 2– Long Term Post Construction Monitoring Samples, February and March, 2015

Prepared for:
AMEC Foster Wheeler
3500 188th Street SW, Ste 601
Lynnwood, WA 98037-4763

September 4, 2015

1.0 Introduction

Data validation was performed on the following sediment samples:

Sample ID	Sample Date/Time	Lab ID	Analyses
SD-PCM01715	02/24/15 09:13	ZX62A	PCBs, Metals, SV, SVSIM, TOC, TS
SD-PCM00715	02/24/15 09:42	ZX62B	PCBs, Metals, SV, SVSIM, TOC, TS, Grain size
SD-PCM02315	02/24/15 10:16	ZX62C	PCBs, Metals, SV, SVSIM, TOC, TS
SD-PCM22315	02/24/15 10:30	ZX62D	PCBs, Metals, SV, SVSIM, TOC, TS
SD-PCM00815	02/24/15 10:51	ZX62E	PCBs, Metals, SV, SVSIM, Dioxin/Furan, TOC, TS
SD-PCM02415	02/24/15 11:11	ZX62F	PCBs, Metals, SV, SVSIM, TOC, TS
SD-PCM01815	02/24/15 11:32	ZX62G	PCBs, Metals, SV, SVSIM, TOC, TS, Grain size
SD-PCM21815	02/24/15 11:46	ZX62H	PCBs, Metals, SV, SVSIM, TOC, TS
SD-PCM02915	02/24/15 13:00	ZX62I	PCBs, Metals, SV, SVSIM, TOC, TS
SD-PCM02815	02/24/15 14:44	ZX62J	PCBs, Metals, SV, SVSIM, TOC, TS
SD-PCM01915	02/24/15 15:01	ZX62K	PCBs, Metals, SV, SVSIM, Dioxin/Furan, TOC, TS
SD-PCM02715	02/25/15 09:49	ZX78A	PCBs, Metals, SV, SVSIM, TOC, TS
SD-PCM03015	02/25/15 10:24	ZX78B	PCBs, Metals, SV, SVSIM, TOC, TS
SD-PCM00915	02/25/15 10:45	ZX78C	PCBs, Metals, SV, SVSIM, TOC, TS
SD-PCM01615	03/10/15 10:03	ZZ74A	PCBs, Metals, SV, SVSIM, TOC, TS
SD-PCM00615	03/10/15 10:22	ZZ74B	PCBs, Metals, SV, SVSIM, TOC, TS
SD-PCM20615	03/10/15 10:36	ZZ74C	PCBs, Metals, SV, SVSIM, TOC, TS
SD-PCM02615	03/10/15 10:56	ZZ74D	PCBs, Metals, SV, SVSIM, TOC, TS
SD-PCM02215	03/10/15 11:15	ZZ74E	PCBs, Metals, SV, SVSIM, TOC, TS
SD-PCM00515	03/10/15 12:46	ZZ74F	PCBs, Metals, SV, SVSIM, TOC, TS, Grain size
SD-PCM01415	03/10/15 13:05	ZZ74G	PCBs, Metals, SV, SVSIM, TOC, TS, Grain size
SD-PCM00215	03/10/15 13:23	ZZ74H	PCBs, Metals, SV, SVSIM, TOC, TS, Grain size
SD-PCM01115	03/10/15 13:41	ZZ74I	PCBs, Metals, SV, SVSIM, TOC, TS, Grain size
SD-PCM01315	03/10/15 14:12	ZZ74J	PCBs, Metals, SV, SVSIM, TOC, TS
SD-PCM01515	03/11/15 08:49	ZZ79A	PCBs, Metals, SV, SVSIM, Dioxin/Furan, TOC, TS
SD-PCM00415	03/11/15 09:10	ZZ79B	PCBs, Metals, SV, SVSIM, Dioxin/Furan, TOC, TS
SD-PCM00315	03/11/15 09:25	ZZ79C	PCBs, Metals, SV, SVSIM, TOC, TS
SD-PCM01215	03/11/15 09:44	ZZ79D	PCBs, Metals, SV, SVSIM, TOC, TS

Sample ID	Sample Date/Time	Lab ID	Analyses
SD-PCM21215	03/11/15 09:56	ZZ79E	PCBs, Metals, SV, SVSIM, TOC, TS
SD-PCM00115	03/11/15 10:09	ZZ79F	PCBs, Metals, SV, SVSIM, Dioxin/Furan, TOC, TS
SD-PCM02115	03/11/15 10:30	ZZ79G	PCBs, Metals, SV, SVSIM, TOC, TS
SD-PCM02015	03/11/15 10:47	ZZ79H	PCBs, Metals, SV, SVSIM, TOC, TS
SD-PCM02515	03/11/15 11:26	ZZ79I	PCBs, Metals, SV, SVSIM, TOC, TS
SD-PCM01015	03/11/15 11:39	ZZ79J	PCBs, Metals, SV, SVSIM, Dioxin/Furan, TOC, TS
SD-PCM03215	03/12/15 13:00	AA03A	PCBs, Metals, SV, SVSIM, TOC, TS
SD-PCM03115	03/12/15 13:20	AA03B	PCBs, Metals, SV, SVSIM, TOC, TS
SD-PCM03315	03/12/15 12:45	AA03C	PCBs, Metals, SV, SVSIM, TOC, TS
SD-PCM03615	03/12/15 15:19	AA03D	PCBs, Metals, SV, SVSIM, TOC, TS
SD-PCM03515	03/12/15 15:32	AA03E	PCBs, Metals, SV, SVSIM, TOC, TS
SD-PCM03415	03/12/15 15:44	AA03F	PCBs, Metals, SV, SVSIM, TOC, TS
SD-PCM00615 RX	03/10/15 10:22	AJD7A	SV, SIM (2,4-Dimethylphenol)
SD-PCM20615 RX	03/10/15 10:36	AJD7B	SV, SIM (2,4-Dimethylphenol)
SD-PCM01915 RX	02/24/15 15:01	AJD7C	SV, SIM (2,4-Dimethylphenol & Benzyl Alcohol)
SD-PCM03215 RX	03/12/15 13:00	AJD7D	SV, SIM (Benzyl Alcohol)
SD-PCM03115 RX	03/12/15 13:20	AJD7E	SV, SIM (Benzyl Alcohol)
SD-PCM03315 RX	03/12/15 12:45	AJD7F	SV, SIM (Benzyl Alcohol)
SD-PCM03615 RX	03/12/15 15:19	AJD7G	SV, SIM (Benzyl Alcohol)
SD-PCM03515 RX	03/12/15 15:32	AJD7H	SV, SIM (Benzyl Alcohol)
SD-PCM03415 RX	03/12/15 15:44	AJD7I	SV, SIM (Benzyl Alcohol)

Grain size analyses were performed by Materials Testing & Consulting, Inc. Remaining analyses were performed by Analytical Resources, Inc. in Tukwila, Washington.

Validation: A full validation was performed on the dioxin/furan analyses. A summary validation was performed on the remaining analyses. Validation was performed by Cari Sayler. Data qualifiers are summarized in section 9.0 of this report.

Analytical methods: Table 1 and table 2 of the QAPP specify the following analytical methods:

Analysis	Method
Polychorinated Biphenyls	EPA 8082 with 3665B/3660B cleanups
Metals(except mercury)	EPA 6010
Mercury	EPA 7471A
Semivolatile Organics	EPA 8270D
Semivolatile Organics (SIM)	EPA 8270D SIM
Dioxins/Furans	EPA 1613B
Total Organic Carbon	EPA 9060
Total Solids	EPA 160.1
Grain size	Not specified

These methods were used with the following exceptions: The most recent version of the methods for PCB (8082A) and ICP metals (6010C) were used. Arsenic was analyzed by method 200.8. Total Organic Carbon (TOC) analyses were performed by Plumb, 1981, and Total solids analyses were performed by EPA method 2540G. Grain size analysis was performed by method PSEP. These are considered acceptable substitutions. Additionally, PCB cleanups included silica gel in addition to the specified sulfur and acid cleanups.

Sample Receipt: Sample chain-of-custodies and sample log-in documentation were reviewed. All requested analyses were performed.

The cooler receipt temperature in SDG AA03/AJD7 was 11.7 °C. However, the samples were received within hours of being collected and had insufficient time to cool. The remaining sample receipt temperatures were within the target range of 2 to 6°C.

Sample number transcription: Sample IDs in the electronic data deliverable (EDD) were compared to the chain-of-custody for each sample. Sample IDs matched the chain of custody with one exception: Sample SD-PCM00915 was reported in the laboratory hardcopy and EDD as SP-PCM00915. The correct sampleID is used throughout this report.

EDD updates: Edits were required to update the EDDs to correct errors in the control limits and the SIM results for sample SD-PCM02715 (ZX78A). The hardcopy report was correct in both cases.

2.0 PCB Analyses

Quality control analysis frequencies: The QAPP specifies that the following quality control samples be analyzed one per analytical batch or one per twenty samples, whichever is more frequent: method blank, and laboratory control sample (LCS). A matrix spike (MS) and MS duplicate (MSD) must be analyzed one per twenty samples and a regional reference material (RRM) must be analyzed one per fifty samples. In addition, surrogate compounds must be measured in each field and quality control sample. These frequencies were met.

Field quality control sample requirements include field duplicates at a 10% frequency. This frequency was met.

Holding times: Refrigerated sediment samples must be extracted within 14 days of collection. Frozen sediment samples must be extracted within 1 year of collection. Extracts must be analyzed within 40 days of extraction. These holding times were met.

Instrument calibration: Data usability criteria for calibrations include minimum correlation coefficients (R^2) of 0.990 or maximum RSDs of ±20% for each initial calibration, and maximum % differences of ±25% for each continuing calibration. These criteria were met.

Laboratory blank results: Criteria for blanks are that analyte concentrations must be below the RL, or below 10% of the lowest associated sample concentration. Contamination was detected in one method blank at a level below the RL as follows:

Blank ID	Analyte	Concentration (ug/kg)	RL (ug/kg)
ZX78 MB	Aroclor 1254	3.8J	4.0

Aroclor 1254 was not detected in the associated samples and no qualifiers are required.

Surrogate recoveries: QAPP control limits were 34-141%. Surrogate recoveries were within QAPP and laboratory control limits.

LCS recoveries: QAPP control limits were 37-116%. LCS recoveries were within QAPP and laboratory control limits.

RRM recoveries: RRM Aroclor 1260 result was 130 ug/kg, within the advisory limits of 38-167%.

MS recoveries: QAPP control limits were 37-116%. MS recoveries were within QAPP and laboratory control limits.

MS/MSD RPDs: QAPP control limits were 50%. RPDs were within QAPP and laboratory control limits.

Field duplicate variability: Field duplicate RPDs were below 50% where the concentrations were above five times the reporting limit. Field duplicate concentrations were within +/- two times the reporting limit where concentrations were at or below five times the reporting limit.

Laboratory flags: Various results are flagged Y to indicate elevated reporting limits. These results are qualified "UY" to clarify that the Aroclor was not detected. Various results were flagged P to indicate the dual column RPD exceeded 40%. These results are qualified as estimated.

Reporting limits: RLs for various aroclors were elevated above 20 ug/Kg due to chromato-graphic overlap with other aroclors and/or non-target analytes. These samples also contained detected aroclors and the impact on the total PCB value was minimal. No qualifiers are assigned on the basis of elevated reporting limits.

Overall assessment: Documentation was found to be clear and complete. Calibration data demonstrate acceptable instrument performance. Blank, surrogate, LCS, and SRM and MS/MSD and field duplicate results demonstrate acceptable accuracy and precision. Two results were estimated due to dual column variability.

PCB data are acceptable for use as qualified.

3.0 Metals Analyses

Quality control analysis frequencies: The QAPP specifies that the following quality control samples be analyzed one per analytical batch or one per twenty samples, whichever is more frequent: method blank, and laboratory control sample (LCS). A matrix spike (MS) and laboratory duplicate must be analyzed one per twenty samples. These frequencies were met.

Field quality control sample requirements include field duplicates at a 10% frequency. This frequency was met.

Holding times: Total or dissolved mercury samples must be analyzed within 28 days of collection. Other metals samples must be analyzed within 180 days of collection. These criteria were met.

Instrument calibration: Functional guidelines criteria for calibration verifications is a maximum % difference of ±10% for ICP metals and ±15% for mercury. QAPP criterion for calibration verifications is ±10% for ICP metals and ±20% for mercury. Criteria for calibration blanks are that analyte concentrations must be between the negative RL and the positive RL. Functional guidelines criterion for detection limit standard recovery is 70-130%, and the QAPP specifies this standard must be within one RL of the true value. These criteria were met.

Laboratory blank results: The criterion for method blanks is that analyte concentrations must be below the PQL, or below 10% of the lowest associated sample concentration. This criterion was met.

LCS recoveries: QAPP control limits were 80-120%. LCS recoveries were within QAPP and laboratory control limits.

SRM recoveries: SRM concentrations were within the advisory range.

MS recoveries: QAPP control limits were 75-125% for ICP metals and 80-120% for mercury. Functional guidelines criteria for both ICP metals and mercury are 75-125%. The MS recoveries were within QAPP and laboratory control limits.

Laboratory duplicate RPDs: QAPP control limits were <20%. For duplicates with concentrations above five times the reporting limit, RPDs were within QAPP and laboratory control limits with the following exceptions:

QC ID	Analyte	RPD	Lab Control Limit
SD-PCM01715 LR	Chromium	37.5	20
SD-PCM01715 LR	Zinc	23.7	20
SD-PCM01515 LR	Chromium	21.1	20
SD-PCM02715 LR	Arsenic	48.6	20
SD-PCM01615 LR	Chromium	21.0	20

These analytes are qualified as estimated in the native sample.

For sample/duplicate pairs with concentrations below five times the reporting limit, absolute differences were within the reporting limit.

Field duplicate variability: Field duplicate RPDs were below 20% where the concentrations were above five times the reporting limit with the following exceptions:

FD ID	Analyte	FD Result (mg/kg)	Sample Result (mg/kg)	RPD
SD-PCM21215 / SD-PCM01215	Arsenic	1.6	2.3	35.9
SD-PCM21815 / SD-PCM01815	Arsenic	3.1	5.7	59.1
SD-PCM20615 / SD-PCM00615	Chromium	20.7	16.2	24.4
SD-PCM21815 / SD-PCM01815	Chromium	18.2	23.9	27.1

These analytes are qualified as estimated in the field duplicates and parent samples.

Field duplicate concentrations were within +/- two times the reporting limit where concentrations were at or below five times the reporting limit.

Reporting limits: Some RLs were elevated above QAPP levels due to dry weight calculation or sample dilution:

Analyte	Highest Reported RL (mg/kg)	QAPP specified RL (mg/kg)	SMS SQS (mg/kg)
Cadmium	1.0	0.2	5.1
Silver	2	0.3	6.1
Mercury	0.030	0.025	0.41

Each elevated RL was below the screening level and the impact on data use is minimal. No qualifiers are assigned on the basis of elevated reporting limits.

Overall assessment: Documentation was found to be clear and complete. Calibration data demonstrate acceptable instrument performance. Method blank, LCS, SRM and MS results demonstrate acceptable laboratory accuracy. Results were estimated based on lab and field duplicate variability.

Metals data are acceptable for use as qualified.

4.0 Semivolatile Organic Analyses

Quality control analysis frequencies: The QAPP specifies that the following quality control samples be analyzed one per analytical batch or one per twenty samples, whichever is more frequent: method blank, and laboratory control sample (LCS). A matrix spike (MS) and MS duplicate (MSD) must be analyzed one per twenty samples. In addition, surrogate compounds must be measured in each field and quality control sample. Field quality control sample requirements include field duplicates at a 10% frequency. These frequencies were met.

Holding times: Refrigerated sediment samples must be extracted within 14 days of collection. Frozen sediment samples must be extracted within 1 year of collection. Extracts must be analyzed within 40 days of extraction. These holding times were met.

Instrument calibration: The current functional guidelines criteria include maximum relative standard deviations (RSDs) of ±40% for poor performers and ±20% for the remaining compounds in the initial calibration, and maximum % differences of ±40% for poor performers and ±25% for the remaining compounds in the continuing calibration. Additionally, the QAPP specifies maximum relative standard deviations (RSDs) of ±20% for the initial calibration, ±20% for each CCC continuing calibration compound, and ±40% for other continuing calibration compounds.

Method 8270D recommends minimum relative response factors (RRF) between 0.01 and 0.9 for various compounds, but allows low responses for non-critical target analytes. The QAPP specifies a minimum RRF of 0.050 for SPCC compounds and 0.010 for other compounds. The current functional guideline specifies minimum RRFs of 0.010 for poor performers and 0.050 for the remaining compounds.

Initial calibration RSDs were below 20%. Continuing calibration % differences were within ±20% with the following exceptions:

SDG	Standard	Analyte	% Difference
ZX78	03/18/15 02:12:00 PM	2,4,6-Tribromophenol	37.1
ZX78	03/18/15 02:12:00 PM	d5-Phenol	-24.5
ZX78	03/18/15 02:12:00 PM	Di-n-butylphthalate	25.8
ZX78	03/18/15 02:12:00 PM	n-Nitrosodiphenylamine	-24.7
ZX78	03/18/15 02:48:00 PM	Hexachlorobutadiene	25
ZX62	03/21/15 03:38:00 PM	Benzoic Acid	66.1
ZX62	03/21/15 03:38:00 PM	Pentachlorophenol	40.4
ZX62	03/23/15 03:52:00 PM	Benzyl alcohol	42.4
ZX62	03/23/15 03:52:00 PM	Butylbenzylphthalate	26.1
ZX62	03/23/15 03:52:00 PM	Pentachlorophenol	65.6
ZZ74/ZZ79	04/01/15 01:29:00 PM	Benzoic Acid	38.8
ZZ74/ZZ79	04/01/15 01:29:00 PM	d5-Nitrobenzene	21.7
ZZ74/ZZ79	04/01/15 02:05:00 PM	Benzyl alcohol	30.3
ZZ74/ZZ79	04/01/15 02:05:00 PM	Butylbenzylphthalate	20.7

SDG	Standard	Analyte	% Difference
ZZ74/ZZ79/AA03	04/02/15 01:20:00 PM	Benzoic Acid	32.2
ZZ74/ZZ79/AA03	04/02/15 01:55:00 PM	Butylbenzylphthalate	20.7
ZZ74/ZZ79/AA03	04/02/15 01:55:00 PM	Pentachlorophenol	-23.4
AA03	04/04/15 03:06:00 PM	Benzoic Acid	40.3

Negative percent differences represent a low response in the continuing calibrations. Positive and non-detect results associated with the negative % differences are qualified as estimated. Positive results associated with the positive % difference are qualified as estimated and the non-detects are considered unaffected.

RRFs for continuing calibration second order quantitations were not reported and could not be reviewed. RRFs in the initial calibration and the remaining RRFs in the continuing calibration were above 0.050.

Laboratory blank results: Criteria for blanks are that analyte concentrations must be below the RL, or below 10% of the lowest associated sample concentration. The following contamination was detected in the method blank:

Blank ID	Analyte	Concentration (ug/kg)	RL (ug/kg)
ZX62MB	Phenol	23	20
ZX78MB	Diethylphthalate	29	20

Associated sample results below five times this level should be considered not detected, and are qualified "U". Associated sample results between five and ten times the blank level are qualified as estimated. Associated sample results above ten times the blank level are considered unaffected.

Surrogate recoveries: QAPP control limits were 30-160%. Laboratory control limits ranged from 24-134 to 37-120%. Surrogate recovery evaluation is based on the more up-to-date laboratory control limits. Surrogate recoveries were within laboratory limits with the following exceptions:

Sample ID	Surrogate	% Recovery	Lab Control Limit
SD-PCM00115	2-Fluorophenol	21.2	27 - 120
SD-PCM00115	2,4,6-Tribromophenol	15.2	24 - 134
SD-PCM00115	d4-2-Chlorophenol	30.7	31 - 120
SD-PCM00215	2-Fluorophenol	24.5	27 - 120
SD-PCM00215	2,4,6-Tribromophenol	14.7	24 - 134
SD-PCM00315	2-Fluorophenol	10.1	27 - 120
SD-PCM00315	2,4,6-Tribromophenol	8.9	24 - 134
SD-PCM00315	d4-2-Chlorophenol	18.9	31 - 120
SD-PCM00415	2-Fluorophenol	9.6	27 - 120
SD-PCM00415	2,4,6-Tribromophenol	6.8	24 - 134
SD-PCM00415	d4-2-Chlorophenol	16.1	31 - 120
SD-PCM00515	2,4,6-Tribromophenol	11.1	24 - 134
SD-PCM00615	2-Fluorophenol	24.7	27 - 120
SD-PCM00615	2,4,6-Tribromophenol	17.2	24 - 134
SD-PCM00815	2-Fluorophenol	22.7	27 - 120
SD-PCM00815	2,4,6-Tribromophenol	19.7	24 - 134
SD-PCM00815	d4-2-Chlorophenol	30.0	31 - 120
SD-PCM01015	2-Fluorophenol	19.2	27 - 120
SD-PCM01015	2,4,6-Tribromophenol	15.2	24 - 134

Sample ID	Surrogate	% Recovery	Lab Control Limit
SD-PCM01015	d4-2-Chlorophenol	27.6	31 - 120
SD-PCM01115	2-Fluorophenol	24.5	27 - 120
SD-PCM01115	2,4,6-Tribromophenol	14.9	24 - 134
SD-PCM01215	2-Fluorophenol	10.3	27 - 120
SD-PCM01215	2,4,6-Tribromophenol	5.1	24 - 134
SD-PCM01215	d4-2-Chlorophenol	18.0	31 - 120
SD-PCM01315	2,4,6-Tribromophenol	19.2	24 – 134
SD-PCM01515	2,4,6-Tribromophenol	21.5	24 – 134
SD-PCM01815	2-Fluorophenol	22.5	27 - 120
SD-PCM01815	2,4,6-Tribromophenol	11.9	24 - 134
SD-PCM01915	2,4,6-Tribromophenol	2.4	24 - 134
SD-PCM01915 MS	2,4,6-Tribromophenol	22.0	24 - 134
SD-PCM02115	2,4,6-Tribromophenol	21.6	24 - 134
SD-PCM02515	2-Fluorophenol	17.3	27 - 120
SD-PCM02515	2,4,6-Tribromophenol	12.8	24 - 134
SD-PCM02515	d4-2-Chlorophenol	25.6	31 - 120
SD-PCM02615	2,4,6-Tribromophenol	22.9	24 - 134
SD-PCM02815	2,4,6-Tribromophenol	3.2	24 - 134
SD-PCM02915	2-Fluorophenol	18.7	27 - 120
SD-PCM02915	2,4,6-Tribromophenol	4.3	24 - 134
SD-PCM02915	d4-2-Chlorophenol	28.5	31 - 120
SD-PCM03315	d5-Phenol	28.8	29 - 120
SD-PCM21215	2-Fluorophenol	11.7	27 - 120
SD-PCM21215	2,4,6-Tribromophenol	10.1	24 - 134
SD-PCM21215	d4-2-Chlorophenol	20.1	31 - 120
SD-PCM22315	2,4,6-Tribromophenol	23.6	24 - 134
ZX78LCS	2,4,6-Tribromophenol	137	24 – 134
SD-PCM03215 RX	d14-p-Terphenyl	24.8	37 - 120
AJD7LCSD	2,4,6-Tribromophenol	144	24 - 134

Both individual recoveries and average recoveries of acid surrogates were evaluated. Where only one of the four acid surrogates is outside of limits, no qualifiers are assigned. No qualifiers are added to samples on the basis of high or low recoveries in the associated QC Samples. No base neutral compounds were reported in the re-extracted sample and no qualifiers are required. For the remaining samples, both non-detect and detected results for acid compounds are qualified as estimated and base/neutral compounds are considered unaffected.

LCS recoveries: QAPP control limits were 30-160%. Laboratory control limits ranged from 10-120 to 53-120%. Recovery evaluation is based on the more up-to-date laboratory control limits. LCS recoveries were within laboratory control limits with the following exceptions:

QC ID	Analyte	% Recovery	Lab Control Limit
AA03LCS	Benzyl Alcohol	3.6	19 - 120
AA03LCSD	Benzoic Acid	127	10 - 120
AA03LCSD	Benzyl Alcohol	3.6	19 - 120
ZX62LCS	Benzoic Acid	135	10 - 120
ZX62LCSD	Benzoic Acid	138	10 - 120

Compounds with very low recoveries (below 10%) are rejected as unusable in the associated samples. Compounds with high recoveries are qualified as estimated in the associated samples for detected results only.

LCS/LCSD RPDs: RPDs were within the laboratory 30% control limit with the following exception:

QC ID	Analyte	RPD	Lab Control Limit
ZX62LCSD	Benzyl Alcohol	32.4	30
AJD7LCSD	2,4-Dimethylphenol	39.8	30

Positive results for these analytes are qualified as estimated in the associated samples.

MS recoveries: QAPP control limits were 30-160%. Laboratory control limits ranged from 10-120 to 53-120%. Recovery evaluation is based on the more up-to-date laboratory control limits. MS recoveries were within these limits with the following exceptions:

QC ID	Analyte	% Recovery	Lab Control Limit
SD-PCM01915 MS	2,4-Dimethylphenol	0.0	10 – 120
SD-PCM01915 MSD	2,4-Dimethylphenol	0.0	10 – 120
SD-PCM01915 MS	2-Methylphenol	26.4	28 – 120
SD-PCM01915 MS	Benzyl Alcohol	3.2	19 – 120
SD-PCM01915 MSD	Benzyl Alcohol	3.0	19 – 120
SD-PCM20615 MS	2,4-Dimethylphenol	4.2	10 – 120
SD-PCM20615 MSD	2,4-Dimethylphenol	3.0	10 – 120
SD-PCM01915 RX MSD	Benzyl Alcohol	15.4	19 - 120

The 2,4-Dimethylphenol and Benzyl alcohol results in sample SD-PCM01915 and the 2,4-Dimethylphenol result in field duplicate SD-PCM20615 and its parent sample SD-PCM00615 are rejected as unusable.

The Benzyl Alcohol result in SD-PCM01915 RX is qualified as estimated. 2-Methylphenol result in SD-PCM01915 was rejected in favor of the SIM result, and no further qualification is required.

MS/MSD RPDs: RPDs were within the QAPP limit of 40% and the laboratory control limit of 30% with the following exceptions:

QC ID	Analyte	RPD	Lab Control Limit
SD-PCM20615 MSD	2,4-Dimethylphenol	33.4	30
SD-PCM20615 MSD	Benzyl Alcohol	80.4	30
SD-PCM01915 RX MSD	2,4-Dimethylphenol	37.5	30
SD-PCM01915 RX MSD	Benzyl Alcohol	35.0	30

2,4-Dimethylphenol result in sample SD-PCM20615 was rejected due to very low MS/MSD recoveries and no further qualification is required. The remaining results were not detected in the parent sample, and no qualifiers are required.

Field duplicate variability: Field duplicate RPDs were below 50% where the concentrations were above five times the reporting limit. Field duplicate concentrations were within +/- two times the reporting limit where concentrations were at or below five times the reporting limit.

Multiple reported results: The analytes reported in the 8270D analysis had some overlap with the analytes reported in the 8270D SIM analyses. These results were compared and reduced to a single reportable result. Unless quality control results warrant the rejection of one result, multiple reported results are evaluated according to the following guidelines

(1) If both results are non-detects, the lower reporting limit was selected.
(2) If one result was not detected and the other detected, the detection was selected.
(3) If both results were detections, the following additional criteria were applied:
    (a) If one result was off-scale and one was on-scale, the on-scale result was selected.
    (b) If associated QC results indicated high bias, the lower concentration result was selected.
    (c) If associated QC results indicated no, low, or mixed biases, the higher concentration result was selected.

This approach is conservative, and is considered most protective of the environment. The results not selected as the best result to report are qualified R2, rejected due to the availability of another result.

Laboratory flags: No additional qualifiers were assigned based on an evaluation of the laboratory flags.

Reporting limits: Some RLs were elevated above QAPP levels as follows:

Analyte	Highest Reported RL (ug/kg)	QAPP specified RL (ug/kg)	SMS SQS (ug/kg)
Bis(2-ethylhexyl)phthalate	50	5	1300
Diethylphthalate	76	5	200
Total Benzofluoranthenes	40	20	3200

Each elevated RL was below the screening level and the impact on data use is minimal. No qualifiers are assigned on the basis of elevated reporting limits.

Overall assessment: Documentation was found to be clear and complete. Results were estimated due to continuing calibration results, blank contamination, and surrogate, LCS and MS accuracy. Rejected results for benzyl alcohol and 2,4-dimethylphenol were replaced by acceptable or estimated re-extraction results.

Except for data replaced by another analysis, semivolatile organic data are acceptable for use as qualified.

5.0 Semivolatile Organic Selective Ion Monitoring (SIM) Analyses

Quality control analysis frequencies: The QAPP specifies that the following quality control samples be analyzed one per analytical batch or one per twenty samples, whichever is more frequent: method blank, and laboratory control sample (LCS). A matrix spike (MS) and MS duplicate (MSD) must be analyzed one per twenty samples. In addition, surrogate compounds must be measured in each field and quality control sample. Field quality control sample requirements include field duplicates at a 10% frequency.

These frequencies were met.

Holding times: Refrigerated sediment samples must be extracted within 14 days of collection. Frozen sediment samples must be extracted within 1 year of collection. Extracts must be analyzed within 40 days of extraction. These holding times were met.

Instrument calibration: The current functional guidelines criteria include maximum relative standard deviations (RSDs) of ±40% for poor performers and ±20% for the remaining

compounds in the initial calibration, and maximum % differences of ±40% for poor performers and ±25% for the remaining compounds in the continuing calibration. Additionally, the QAPP specifies maximum relative standard deviations (RSDs) of ±20% for the initial calibration, ±20% for each CCC continuing calibration compound and ±40% for other continuing calibration compounds.

Method 8270D recommends minimum relative response factors (RRF) between 0.01 and 0.9 for various compounds, but allows low responses for non-critical target analytes. The QAPP specifies a minimum RRF of 0.050 for SPCC compounds and 0.010 for other compounds. The current functional guideline specifies minimum RRFs of 0.010 for poor performers and 0.050 for the remaining compounds.

Initial calibration RSDs were below 20%. Continuing calibration % differences were within ±20% with the following exceptions:

SDG	Standard	Analyte	% Difference
ZX62	03/23/15 15:52	Benzyl alcohol	42.4
ZX62	03/23/15 15:52	Pentachlorophenol	65.6
ZX62	03/23/15 15:52	Butylbenzylphthalate	26.1
ZX78	03/18/15 14:48	Hexachlorobutadiene	25.0
ZZ74/ZZ79	04/01/15 14:05	Benzyl alcohol	30.3
ZZ74/ZZ79	04/01/15 14:05	Butylbenzylphthalate	20.7
ZZ74/ZZ79/AA03	04/02/15 13:55	Pentachlorophenol	-23.4
ZZ74/ZZ79/AA03	04/02/15 13:55	Butylbenzylphthalate	20.7
ZX62	03/23/15 15:52	Benzyl alcohol	42.4
ZX62	03/23/15 15:52	Pentachlorophenol	65.6
ZX62	03/23/15 15:52	Butylbenzylphthalate	26.1
ZX78	03/18/15 14:48	Hexachlorobutadiene	25.0
ZZ74/ZZ79	04/01/15 14:05	Benzyl alcohol	30.3
ZZ74/ZZ79	04/01/15 14:05	Butylbenzylphthalate	20.7
ZZ74/ZZ79/AA03	04/02/15 13:55	Pentachlorophenol	-23.4
ZZ74/ZZ79/AA03	04/02/15 13:55	Butylbenzylphthalate	20.7

Negative percent differences represent a low response in the continuing calibrations. Positive and non-detect results associated with the negative % differences are qualified as estimated. Positive results associated with the positive % difference are qualified as estimated and the non-detects are considered unaffected.

RRFs for continuing calibration second order quantitations were not reported and could not be reviewed. RRFs in the initial calibration and the remaining RRFs in the continuing calibration were above 0.050.

Laboratory blank results: Criteria for blanks are that analyte concentrations must be below the RL, or below 10% of the lowest associated sample concentration. No contamination was detected in the method blanks.

Surrogate recoveries: Laboratory control limits ranged from 27-100 to 37-120%. Recovery evaluation is based on the more up-to-date laboratory control limits. Surrogate recoveries were within the laboratory limits with the following exception:

Sample ID	Surrogate	% Recovery	Lab Control Limit
SD-PCM00115	2-Fluorophenol	21.5	27 - 120
SD-PCM00215	2-Fluorophenol	25.3	27 - 120

Sample ID	Surrogate	% Recovery	Lab Control Limit
SD-PCM00315	2-Fluorophenol	11.1	27 - 120
SD-PCM00415	2-Fluorophenol	9.5	27 - 120
SD-PCM00615	2-Fluorophenol	26.8	27 - 120
SD-PCM00815	2-Fluorophenol	23.7	27 - 120
SD-PCM01015	2-Fluorophenol	19.6	27 - 120
SD-PCM01115	2-Fluorophenol	25.9	27 - 120
SD-PCM01215	2-Fluorophenol	10.9	27 - 120
SD-PCM01815	2-Fluorophenol	22.8	27 - 120
SD-PCM02515	2-Fluorophenol	16.8	27 - 120
SD-PCM02915	2-Fluorophenol	20.9	27 - 120
SD-PCM21215	2-Fluorophenol	13.3	27 – 120
SD-PCM03215 RX	d14-p-Terphenyl	19.6	37 - 120

The results for acid compounds in the samples with low 2-Fluorophenol recoveries are qualified as estimated and base-neutral compounds are considered unaffected. No base neutral compounds were reported in the re-extracted sample and no qualifiers are required.

LCS recoveries: QAPP control limits were 30-160%. Laboratory control limits ranged from 10-120 to 38-120%. Recovery evaluation is based on the more up-to-date laboratory control limits. LCS recoveries were within the laboratory limits with the following exceptions:

QC ID	Analyte	% Recovery	Lab Control Limit
AA03LCS	Benzyl Alcohol	2.8	25 – 123
AA03LCSD	Benzyl Alcohol	3.0	25 – 123

Benzyl Alcohol results in the associated samples are rejected as unusable.

LCS/LCSD RPDs: RPDs were within the laboratory 30% control limit with the following exception:

QC ID	Analyte	RPD	Lab Control Limit
ZX62LCSD	Benzyl Alcohol	70.0	30
AJD7LCSD	2,4-Dimethylphenol	36.1	30

The associated benzyl alcohol results have been qualified based on the very low LCS and LCSD recoveries, and no further qualification is required. The associated 2,4-Dimethylphenol results are qualified as estimated.

MS recoveries: QAPP control limits were 30-160%. Laboratory control limits ranged from 10 - 120 to 38-120%. Recovery evaluation is based on the more up-to-date laboratory control limits. MS recoveries were within the laboratory limits with the following exceptions:

QC ID	Analyte	% Recovery	Lab Control Limit
SD-PCM01915 MS	2,4-Dimethylphenol	0	10 - 120
SD-PCM01915 MSD	2,4-Dimethylphenol	0	10 - 120
SD-PCM20615 MS	2,4-Dimethylphenol	4.1	10 - 120
SD-PCM20615 MSD	2,4-Dimethylphenol	3.4	10 - 120
SD-PCM01915 MS	Benzyl Alcohol	2.9	25 - 123
SD-PCM01915 MSD	Benzyl Alcohol	2.5	25 – 123
SD-PCM01915 RX MS	Benzyl Alcohol	20.1	25 - 123
SD-PCM01915 RX MSD	Benzyl Alcohol	13.7	25 - 123

The 2,4-Dimethylphenol and Benzyl alcohol results in sample SD-PCM01915 and the 2,4-Dimethylphenol result in field duplicate SD-PCM20615 and its parent sample SD-PCM00615 are rejected as unusable. The Benzyl Alcohol result in SD-PCM01915 RX was rejected in favor of the 8270D result, and no further qualification is required.

MS/MSD RPDs: RPDs were within the QAPP limit of 40% and the laboratory control limit of 30% with one exception:

QC ID	Analyte	RPD	Lab Control Limit
SD-PCM20615 MSD	Benzyl Alcohol	109	30
SD-PCM01915 RX MSD	2,4-Dimethylphenol	41.9	30
SD-PCM01915 RX MSD	Benzyl Alcohol	38.0	30

Positive results in the associated samples are qualified as estimated.

Field duplicate variability: Field duplicate RPDs were below 50% where the concentrations were above five times the reporting limit. Field duplicate concentrations were within +/- two times the reporting limit where concentrations were at or below five times the reporting limit.

Multiple reported results: The analytes reported in the 8270D analysis had some overlap with the analytes reported in the 8270D SIM analyses. These results were compared and reduced to a single reportable result. Results are evaluated according to the guidelines listed in section 4.0 above.

Laboratory flags: One 2-methylphenol result was flagged 'M' by the laboratory indicating a poor spectral match. The corresponding validation qualifier, 'N' for presumed present, is assigned. One benzyl alcohol result was flagged Y to indicate an elevated reporting limit. This result is qualified "UY" to clarify that the compound was not detected.

Reporting limits: Various RLs were elevated above QAPP levels:

Analyte	Highest Reported RL (ug/kg)	QAPP specified RL (ug/kg)	SMS SQS (ug/kg)
2,4-Dimethylphenol	25	20	29
Benzyl Alcohol	22	20	57

Reporting limits were below screening levels and the impact on data use is minimal. No qualifiers are assigned on the basis of elevated reporting limits.

Overall assessment: Documentation was found to be clear and complete. The majority of results were accepted without qualification. Some results were estimated due to calibration results or surrogate or matrix spike recoveries. Rejected results for benzyl alcohol and 2,4-dimethylphenol were replaced by acceptable or estimated re-extraction results. One result was qualified as presumed present due to poor spectral match.

Except for data replaced by another analysis, semivolatile SIM organic data are acceptable for use as qualified.

6.0 Dioxin/Furan Analyses

Quality control analysis frequencies: The method specifies that method blank and ongoing precision and recovery (OPR) samples must be analyzed with each batch. In addition, carbon-13 labeled isotope dilution standards and a chlorine-37 labeled cleanup standard must be measured in each field and quality control sample. These criteria were met.

Analysis holding times: Method 1613B specifies a 40 day holding time between extraction and analysis, but does not specify a holding time from sampling to extraction for sediments. Functional guidelines recommends analysis holding times of one year, if frozen. These holding times were met.

System performance checks: The tune must demonstrate a resolving power >10,000 at m/z 304.9825. In addition, the window defining mix must meet relative retention criteria and demonstrate a valley <25% for all peaks near 2,3,7,8-TCDD and 2,3,7,8-TCDF. These criteria were met.

Instrument calibration: Initial calibration criteria include 1) maximum percent relative standard deviations (%RSD) of ≤20% for unlabeled compounds with an isotopically labeled analog and ≤35% for 1,2,3,7,8,9-HxCDD, OCDF, and labeled compounds, 2) Ion abundance ratios must be within ± 15% of theoretical, and 3) signal to noise ratios must be above 10. Continuing calibration criteria include 1) maximum percent differences (%D) between the initial calibration and the continuing calibration of ≤20% for unlabeled compounds with an isotopically labeled analog and ≤35% for 1,2,3,7,8,9-HxCDD, OCDF, and labeled compounds, 2) Ion abundance ratios must be within ± 15% of theoretical, and 3) signal to noise ratios must be above 10 . These criteria were met.

Laboratory blank results: Method 1613B states that the method blank must not contain any 2,3,7,8-substituted CDD/CDF or potentially interfering compound at greater than the minimum level or one-third the regulatory compliance level, whichever is greater. This criterion was met. However, all method blank contamination is evaluated for its impact on the reported sample results.

The following compounds were detected in the method blank:

Blank ID	Analyte	Concentration (pg/g)	RL (pg/g)
ZX62MB	1,2,3,6,7,8-HxCDD	0.046J	1.00
ZZ79MB	OCDD	4	2.00
ZX62MB	2,3,7,8-TCDF	0.044J	1.00
ZX62MB	1,2,3,6,7,8-HxCDF	0.154J	1.00
ZX62MB	1,2,3,7,8,9-HxCDF	0.082J	1.00
ZX62MB	1,2,3,4,6,7,8-HpCDD	1.6	1.00
ZX62MB	Total HpCDD	4.64	2.00
ZX62MB	OCDD	8.66	2.00
ZZ79MB	2,3,4,7,8-PeCDF	0.054J	1.00
ZZ79MB	1,2,3,6,7,8-HxCDF	0.05J	1.00
ZZ79MB	1,2,3,7,8,9-HxCDF	0.086J	1.00
ZZ79MB	1,2,3,4,6,7,8-HpCDF	0.066J	1.00
ZZ79MB	Total HpCDF	0.0656	2.00
ZZ79MB	1,2,3,6,7,8-HxCDD	0.044J	1.00

Concentrations of these analytes in associated samples which were below 5 times the blank

concentration are qualified 'U' and should be considered not detected at the reported value. Concentrations of these analytes in associated samples which were between 5 and 10 times the blank concentration are qualified as estimated. Concentrations above 5 times the blank concentration are considered unaffected.

The following compounds were reported with estimated maximum possible concentrations in the method blank:

Blank ID	Analyte	Concentration (pg/g)	RL (pg/g)
ZZ79MB	1,2,3,4,6,7,8-HpCDD	0.69 JEMPC	1.00
ZZ79MB	Total HpCDD	1.8 EMPC	2.00
ZX62MB	Total TCDF	1.48 EMPC	1.00
ZX62MB	Total PeCDD	0.0686 EMPC	1.00
ZX62MB	1,2,3,4,7,8-HxCDF	0.128 JEMPC	1.00
ZX62MB	2,3,4,6,7,8-HxCDF	0.098 JEMPC	1.00
ZX62MB	Total HxCDF	1.46 EMPC	2.00
ZX62MB	Total HxCDD	1.46 EMPC	2.00
ZX62MB	1,2,3,4,6,7,8-HpCDF	0.202 JEMPC	1.00
ZX62MB	1,2,3,4,7,8,9-HpCDF	0.028 JEMPC	1.00
ZX62MB	Total HpCDF	0.427 EMPC	2.00
ZX62MB	Total TCDD	0.0696 EMPC	1.00
ZX62MB	1,2,3,7,8-PeCDF	0.152 JEMPC	1.00
ZX62MB	Total PeCDF	0.54 EMPC	2.00
ZZ79MB	Total TCDD	0.0492 EMPC	1.00
ZZ79MB	Total PeCDF	0.8 EMPC	2.00
ZZ79MB	1,2,3,4,7,8-HxCDF	0.06 JEMPC	1.00
ZZ79MB	2,3,4,6,7,8-HxCDF	0.044 JEMPC	1.00
ZZ79MB	Total HxCDF	0.533 EMPC	2.00
ZZ79MB	Total HxCDD	0.446 EMPC	2.00
ZZ79MB	Total TCDF	0.753 EMPC	1.00

Associated detected sample results within five times these levels are qualified as estimated.

C_{13} labeled isotope dilution standard recoveries: Isotope dilution standard recoveries were within laboratory control limits.

Cl_{37} labeled cleanup standard recoveries: Cleanup standard recoveries were within laboratory control limits.

OPR recoveries: OPR recoveries were within laboratory control limits.

Compound Identification: Method criteria for compound identification include: 1) The signals of the characteristic ions must maximize within the same 2 seconds. 2) The signal to noise ratio must be greater than 2.5. 3) Ion abundance ratios must be within $\pm$ 15% of theoretical, or within $\pm$10% of the calibration verification standard. 4) The relative retention times must be within the RT Window. 5) Interferences from polychlorinated diphenyl ether compounds must be evaluated.

These criteria were reviewed for each target analyte in the six samples. Where compounds did not meet ion abundance ratio requirements, the lab appropriately flagged the results as estimated maximum possible concentrations (EMPCs). No discrepancies were noted.

Compound Quantitation: Sample concentrations were recalculated to verify sample quantitations. No discrepancies were noted.

Second column confirmation: Second column confirmation was not required to separate of 2,3,7,8-TCDF from other TCDF isomers due to the use of RTX Dioxin-2 Column.

Estimated detection limits: Estimated detection limits (EDLs) were recalculated to verify quantitations. No discrepancies were noted. All EDLs met QAPP target reporting limits.

Toxicity equivalent quantity (TEQ): Functional guidelines indicates that two TEQs should be calculated: One with EMPCs and EDLs included at their full reported value and one excluding EDLs and EMPCs. However, DMMP guidance indicates that different TEQs should be calculated: One with EMPCs and EDLs included at half their reported value and one excluding EDLs and EMPCs.

Recalculation of the TEQ was performed as follows:

Sample ID	TEQ-1	TEQ-½	TEQ-0
SD-PCM00115	0.293	0.157	0.0209
SD-PCM00415	0.320	0.173	0.0261
SD-PCM00815	0.109	0.0563	0.0031
SD-PCM01015	0.393	0.231	0.0692
SD-PCM01515	0.184	0.0991	0.0141
SD-PCM01915	0.280	0.143	0.00608

Where:
TEQ-1 = TEQ with 2005 WHO TEFs including full values of both EDLs and EMPCs.
TEQ-½ = TEQ with 2005 WHO TEFs including ½ values of both EDLs and EMPCs.
TEQ-0 = TEQ with 2005 WHO TEFs excluding EDLs and EMPCs.

Laboratory flags: The laboratory appropriately flagged concentrations and EMPCs below the low standard as estimated "J". No further qualification was necessary.

Overall assessment: Documentation was found to be clear and complete. No discrepancies were noted in analyte identification or result quantitation. Calibration data and system performance checks demonstrate acceptable instrument performance. Quality control results indicate acceptable accuracy. Blank contamination resulted in estimated concentrations and elevated but acceptable reporting limits.

Dioxin/furan data are acceptable for use as qualified.

7.0 General Chemistry Analyses

Quality control analysis frequencies: For total organic carbon, a method blank, SRM, LCS, MS, and a laboratory triplicate were analyzed in each batch. For total solids, each batch included a method blank, and laboratory triplicate, although one of the laboratory triplicates was from a non-project sample. Quality control samples were sufficient to evaluate overall precision and accuracy as appropriate for the method.

Field quality control sample requirements include field duplicates at a 10% frequency. This frequency was met.

Holding times: Holding times are as follows:

Analysis	Holding time if refrigerated	Holding time if frozen
TOC	28 days	6 months
Total Solids	14 days	6 months

Samples were analyzed within the holding times.

Instrument calibration: Instrument calibration criteria are as follows:

Analysis	Criteria
TOC	Initial calibration $R^2 > 0.990$ Continuing calibration recovery within 90-110%
Total Solids	Calibration mass within $\pm$ 0.1 g

These criteria were met.

Laboratory blank results: Criteria for method blanks are that analyte concentrations must be below the PQL, or below 10% of the lowest associated sample concentration. This criterion was met for all method blanks.

LCS recoveries: Control limits were 75-125% for TOC. These criteria were met.

SRM results: Control limits were 80-120% for TOC. These criteria were met.

MS recoveries: Control limits were 75-125% for TOC. These criteria were met.

Laboratory triplicate results: Control limits were 20% for TOC and total solids. These criteria were met with the following exception:

QC ID	Analyte	RSD	Lab Control Limit
SD-PCM01615 LT	Total Organic Carbon	32.1	20.0
SD-PCM01715 LT	Total Organic Carbon	32.4	20.0

The total organic carbon results are qualified as estimated in native samples.

Field duplicate variability: Field duplicate RPDs were below 25% where the concentrations were above five times the reporting limit. Field duplicate concentrations were within +/- two times the reporting limit where concentrations were at or below five times the reporting limit with one exception:

FD ID	Analyte	FD Result (%)	Sample Result (%)	RL
SD-PCM21815 / SD-PCM01815	Total Organic Carbon	0.187	0.059	0.020

This analyte is qualified as estimated in the field duplicate and parent sample.

Overall assessment: Documentation was found to be clear and complete. Calibration data indicate acceptable performance. Method blank, LCS , SRM, and MS results demonstrate acceptable laboratory accuracy. Data were estimated based on laboratory triplicate and field duplicate variability.

General chemistry results are acceptable for use as qualified.

8.0 Grain Size Analyses

Quality control analysis frequencies: This batch included a laboratory triplicate, meeting frequency requirements.

Holding times: Sediment samples must be analyzed within 6 months of collection. Samples were analyzed within the holding time.

Laboratory triplicate RSDs: Triplicate RSDs were within 20%.

Grain size data are acceptable for use as reported.

9.0 Qualifier Summary Table

Client ID	Analyte(s)	Qualifier	Reason
Polychorinated Biphenyl Analyses			
SD-PCM02015	Aroclor 1242	UY	Clarification of Y flag
SD-PCM02015	Aroclor 1254	J	High dual column RPD
SD-PCM03115	Aroclor 1254	UY	Clarification of Y flag
SD-PCM03215	Aroclor 1260	J	High dual column RPD
SD-PCM03215	Aroclor 1248	UY	Clarification of Y flag
SD-PCM03415	Aroclor 1254	UY	Clarification of Y flag
SD-PCM03515	Aroclor 1254	UY	Clarification of Y flag
SD-PCM03615	Aroclor 1254	UY	Clarification of Y flag
Metals Analyses			
SD-PCM00615	Chromium	J	High FD RPD
SD-PCM01215	Arsenic	J	High FD RPD
SD-PCM01515	Chromium	J	High lab duplicate RPD
SD-PCM01615	Chromium	J	High lab duplicate RPD
SD-PCM01715	Chromium, Zinc	J	High lab duplicate RPD
SD-PCM01815	Arsenic, Chromium	J	High FD RPD
SD-PCM02715	Arsenic	J	High lab duplicate RPD
SD-PCM20615	Chromium	J	High FD RPD
SD-PCM21215	Arsenic	J	High FD RPD
SD-PCM21815	Arsenic, Chromium	J	High FD RPD
Semivolatile Analyses			
SD-PCM00115	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Benzyl Alcohol, Butylbenzylphthalate, Dibenz(a,h)Anthracene, Dimethylphthalate, Hexachlorobenzene, Hexachlorobutadiene, N-Nitrosodiphenylamine, Pentachlorophenol	R2	Result available from another method
SD-PCM00115	4-Methylphenol, Benzoic Acid, Phenol	UJ	Low surrogate recovery
SD-PCM00215	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Benzyl Alcohol, Butylbenzylphthalate, Dibenz(a,h)Anthracene, Dimethylphthalate, Hexachlorobenzene, Hexachlorobutadiene, N-Nitrosodiphenylamine, Pentachlorophenol	R2	Result available from another method
SD-PCM00215	4-Methylphenol, Benzoic Acid, Phenol	UJ	Low surrogate recovery

Client ID	Analyte(s)	Qualifier	Reason
SD-PCM00315	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Benzyl Alcohol, Butylbenzylphthalate, Dibenz(a,h)Anthracene, Dimethylphthalate, Hexachlorobenzene, Hexachlorobutadiene, N-Nitrosodiphenylamine, Pentachlorophenol	R2	Result available from another method
SD-PCM00315	4-Methylphenol, Benzoic Acid, Phenol	UJ	Low average surrogate recovery
SD-PCM00415	Diethylphthalate	J	Low surrogate recovery
SD-PCM00415	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Butylbenzylphthalate, Dibenz(a,h)Anthracene, Dimethylphthalate, Hexachlorobenzene, Hexachlorobutadiene, N-Nitrosodiphenylamine, Pentachlorophenol	R2	Result available from another method
SD-PCM00415	4-Methylphenol, Benzoic Acid, Benzyl Alcohol, Phenol	UJ	Low average surrogate recovery
SD-PCM00515	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Butylbenzylphthalate, Dibenz(a,h)Anthracene, Dimethylphthalate, Hexachlorobenzene, Hexachlorobutadiene, N-Nitrosodiphenylamine, Pentachlorophenol	R2	Result available from another method
SD-PCM00615	2,4-Dimethylphenol	R,R1	Very low MS and MSD recoveries
SD-PCM00615	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2-Methylphenol, Benzyl Alcohol, Butylbenzylphthalate, Dibenz(a,h)Anthracene, Dimethylphthalate, Hexachlorobenzene, Hexachlorobutadiene, N-Nitrosodiphenylamine, Pentachlorophenol	R2	Result available from another method
SD-PCM00615	4-Methylphenol, Benzoic Acid, Phenol	UJ	Low surrogate recovery
SD-PCM00615 RX	2,4-Dimethylphenol	R2	Result available from another method
SD-PCM00715	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Butylbenzylphthalate, Dibenz(a,h)Anthracene, Dimethylphthalate, Hexachlorobenzene, Hexachlorobutadiene, N-Nitrosodiphenylamine, Pentachlorophenol	R2	Result available from another method
SD-PCM00815	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Benzyl Alcohol, Butylbenzylphthalate, Dibenz(a,h)Anthracene, Dimethylphthalate, Hexachlorobenzene, Hexachlorobutadiene, N-Nitrosodiphenylamine, Pentachlorophenol	R2	Result available from another method
SD-PCM00815	4-Methylphenol, Benzoic Acid, Phenol	UJ	Low surrogate recovery
SD-PCM00915	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Benzyl Alcohol, Butylbenzylphthalate, Dibenz(a,h)Anthracene, Dimethylphthalate, Hexachlorobenzene, Hexachlorobutadiene, N-Nitrosodiphenylamine, Pentachlorophenol	R2	Result available from another method
SD-PCM00915	Diethylphthalate	U	Blank Contamination

Client ID	Analyte(s)	Qualifier	Reason
SD-PCM01015	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Butylbenzylphthalate, Dibenz(a,h)Anthracene, Dimethylphthalate, Hexachlorobenzene, Hexachlorobutadiene, N-Nitrosodiphenylamine, Pentachlorophenol	R2	Result available from another method
SD-PCM01015	4-Methylphenol, Benzoic Acid, Benzyl Alcohol, Phenol	UJ	Low surrogate recovery
SD-PCM01115	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Butylbenzylphthalate, Dibenz(a,h)Anthracene, Dimethylphthalate, Hexachlorobenzene, Hexachlorobutadiene, N-Nitrosodiphenylamine, Pentachlorophenol	R2	Result available from another method
SD-PCM01115	4-Methylphenol, Benzoic Acid, Benzyl Alcohol, Phenol	UJ	Low surrogate recovery
SD-PCM01215	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Benzyl Alcohol, Butylbenzylphthalate, Dibenz(a,h)Anthracene, Dimethylphthalate, Hexachlorobenzene, Hexachlorobutadiene, N-Nitrosodiphenylamine, Pentachlorophenol	R2	Result available from another method
SD-PCM01215	4-Methylphenol, Benzoic Acid, Phenol	UJ	Low average surrogate recovery
SD-PCM01315	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Butylbenzylphthalate, Dibenz(a,h)Anthracene, Dimethylphthalate, Hexachlorobenzene, Hexachlorobutadiene, N-Nitrosodiphenylamine, Pentachlorophenol	R2	Result available from another method
SD-PCM01415	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Benzyl Alcohol, Butylbenzylphthalate, Dibenz(a,h)Anthracene, Dimethylphthalate, Hexachlorobenzene, Hexachlorobutadiene, N-Nitrosodiphenylamine, Pentachlorophenol	R2	Result available from another method
SD-PCM01515	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Butylbenzylphthalate, Dibenz(a,h)Anthracene, Dimethylphthalate, Hexachlorobenzene, Hexachlorobutadiene, N-Nitrosodiphenylamine, Pentachlorophenol	R2	Result available from another method
SD-PCM01615	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Benzyl Alcohol, Butylbenzylphthalate, Dibenz(a,h)Anthracene, Dimethylphthalate, Hexachlorobenzene, Hexachlorobutadiene, N-Nitrosodiphenylamine, Pentachlorophenol	R2	Result available from another method
SD-PCM01715	Benzoic Acid	J	High LCS and LCSD recoveries, High CCV
SD-PCM01715	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Butylbenzylphthalate, Dibenz(a,h)Anthracene, Dimethylphthalate, Hexachlorobenzene, Hexachlorobutadiene, N-Nitrosodiphenylamine, Pentachlorophenol	R2	Result available from another method

Client ID	Analyte(s)	Qualifier	Reason
SD-PCM01815	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Butylbenzylphthalate, Dibenz(a,h)Anthracene, Dimethylphthalate, Hexachlorobenzene, Hexachlorobutadiene, N-Nitrosodiphenylamine, Pentachlorophenol	R2	Result available from another method
SD-PCM01815	4-Methylphenol, Benzoic Acid, Benzyl Alcohol, Phenol	UJ	Low surrogate recovery
SD-PCM01915	2,4-Dimethylphenol, Benzyl Alcohol	R,R1	Very low MS and MSD recoveries
SD-PCM01915	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2-Methylphenol, Butylbenzylphthalate, Dibenz(a,h)Anthracene, Dimethylphthalate, Hexachlorobenzene, Hexachlorobutadiene, N-Nitrosodiphenylamine, Pentachlorophenol	R2	Result available from another method
SD-PCM01915 RX	2,4-Dimethylphenol	R2	Result available from another method
SD-PCM01915 RX	Benzyl Alcohol	UJ	Low MSD recovery
SD-PCM02015	Benzoic Acid	J	High CCV
SD-PCM02015	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Dibenz(a,h)Anthracene, Dimethylphthalate, Hexachlorobenzene, Hexachlorobutadiene, N-Nitrosodiphenylamine, Pentachlorophenol	R2	Result available from another method
SD-PCM02115	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Butylbenzylphthalate, Dibenz(a,h)Anthracene, Dimethylphthalate, Hexachlorobenzene, Hexachlorobutadiene, N-Nitrosodiphenylamine, Pentachlorophenol	R2	Result available from another method
SD-PCM02215	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Butylbenzylphthalate, Dibenz(a,h)Anthracene, Dimethylphthalate, Hexachlorobenzene, Hexachlorobutadiene, N-Nitrosodiphenylamine, Pentachlorophenol	R2	Result available from another method
SD-PCM02315	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Benzyl Alcohol, Butylbenzylphthalate, Dibenz(a,h)Anthracene, Dimethylphthalate, Hexachlorobenzene, Hexachlorobutadiene, N-Nitrosodiphenylamine, Pentachlorophenol	R2	Result available from another method
SD-PCM02415	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Butylbenzylphthalate, Dibenz(a,h)Anthracene, Dimethylphthalate, Hexachlorobenzene, Hexachlorobutadiene, N-Nitrosodiphenylamine, Pentachlorophenol	R2	Result available from another method
SD-PCM02515	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Butylbenzylphthalate, Dibenz(a,h)Anthracene, Dimethylphthalate, Hexachlorobenzene, Hexachlorobutadiene, N-Nitrosodiphenylamine, Pentachlorophenol	R2	Result available from another method
SD-PCM02515	4-Methylphenol, Benzoic Acid, Benzyl Alcohol, Phenol	UJ	Low surrogate recovery

Client ID	Analyte(s)	Qualifier	Reason
SD-PCM02615	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Benzyl Alcohol, Butylbenzylphthalate, Dibenz(a,h)Anthracene, Dimethylphthalate, Hexachlorobenzene, Hexachlorobutadiene, N-Nitrosodiphenylamine, Pentachlorophenol	R2	Result available from another method
SD-PCM02715	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Butylbenzylphthalate, Dibenz(a,h)Anthracene, Dimethylphthalate, Hexachlorobenzene, Hexachlorobutadiene, N-Nitrosodiphenylamine, Pentachlorophenol	R2	Result available from another method
SD-PCM02715	Diethylphthalate	U	Blank Contamination
SD-PCM02815	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Butylbenzylphthalate, Dibenz(a,h)Anthracene, Dimethylphthalate, Hexachlorobenzene, Hexachlorobutadiene, N-Nitrosodiphenylamine, Pentachlorophenol	R2	Result available from another method
SD-PCM02915	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Benzyl Alcohol, Butylbenzylphthalate, Dibenz(a,h)Anthracene, Dimethylphthalate, Hexachlorobenzene, Hexachlorobutadiene, N-Nitrosodiphenylamine, Pentachlorophenol	R2	Result available from another method
SD-PCM02915	4-Methylphenol, Benzoic Acid, Phenol	UJ	Low average surrogate recovery
SD-PCM03015	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Butylbenzylphthalate, Dibenz(a,h)Anthracene, Dimethylphthalate, Hexachlorobenzene, Hexachlorobutadiene, N-Nitrosodiphenylamine, Pentachlorophenol	R2	Result available from another method
SD-PCM03015	Diethylphthalate	U	Blank Contamination
SD-PCM03115	Benzoic Acid	J	High LCSD recovery, High CCV
SD-PCM03115	Benzyl Alcohol	R,R1	Very low LCS and LCSD recoveries
SD-PCM03115	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Butylbenzylphthalate, Dibenz(a,h)Anthracene, Dimethylphthalate, Hexachlorobenzene, Hexachlorobutadiene, N-Nitrosodiphenylamine, Pentachlorophenol	R2	Result available from another method
SD-PCM03215	Benzoic Acid	J	High LCSD recovery, High CCV
SD-PCM03215	Benzyl Alcohol	R,R1	Very low LCS and LCSD recoveries
SD-PCM03215	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Butylbenzylphthalate, Dibenz(a,h)Anthracene, Dimethylphthalate, Hexachlorobenzene, Hexachlorobutadiene, N-Nitrosodiphenylamine, Pentachlorophenol	R2	Result available from another method
SD-PCM03215 RX	Benzyl Alcohol	R2	Result available from another method
SD-PCM03315	Benzyl Alcohol	R,R1	Very low LCS and LCSD recoveries

Client ID	Analyte(s)	Qualifier	Reason
SD-PCM03315	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Butylbenzylphthalate, Dibenz(a,h)Anthracene, Dimethylphthalate, Hexachlorobenzene, Hexachlorobutadiene, N-Nitrosodiphenylamine, Pentachlorophenol	R2	Result available from another method
SD-PCM03415	Benzyl Alcohol	R,R1	Very low LCS and LCSD recoveries
SD-PCM03415	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Butylbenzylphthalate, Dibenz(a,h)Anthracene, Dimethylphthalate, Hexachlorobenzene, Hexachlorobutadiene, N-Nitrosodiphenylamine, Pentachlorophenol	R2	Result available from another method
SD-PCM03515	Benzoic Acid	J	High LCSD recovery
SD-PCM03515	Benzyl Alcohol	R,R1	Very low LCS and LCSD recoveries
SD-PCM03515	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Butylbenzylphthalate, Dibenz(a,h)Anthracene, Dimethylphthalate, Hexachlorobenzene, Hexachlorobutadiene, N-Nitrosodiphenylamine, Pentachlorophenol	R2	Result available from another method
SD-PCM03615	Benzyl Alcohol	R,R1	Very low LCS and LCSD recoveries
SD-PCM03615	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Butylbenzylphthalate, Dibenz(a,h)Anthracene, Dimethylphthalate, Hexachlorobenzene, Hexachlorobutadiene, N-Nitrosodiphenylamine, Pentachlorophenol	R2	Result available from another method
SD-PCM20615	2,4-Dimethylphenol	R,R1	Very low MS and MSD recoveries, highMS/MSD RPD
SD-PCM20615	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2-Methylphenol, Butylbenzylphthalate, Dibenz(a,h)Anthracene, Dimethylphthalate, Hexachlorobenzene, Hexachlorobutadiene, N-Nitrosodiphenylamine, Pentachlorophenol	R2	Result available from another method
SD-PCM20615 RX	2,4-Dimethylphenol	R2	Result available from another method
SD-PCM21215	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Butylbenzylphthalate, Dibenz(a,h)Anthracene, Dimethylphthalate, Hexachlorobenzene, Hexachlorobutadiene, N-Nitrosodiphenylamine, Pentachlorophenol	R2	Result available from another method
SD-PCM21215	4-Methylphenol, Benzoic Acid, Benzyl Alcohol, Phenol	UJ	Low surrogate recovery
SD-PCM21815	Benzoic Acid	J	High LCS and LCSD recoveries, High CCV
SD-PCM21815	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Butylbenzylphthalate, Dibenz(a,h)Anthracene, Dimethylphthalate, Hexachlorobenzene, Hexachlorobutadiene, N-Nitrosodiphenylamine, Pentachlorophenol	R2	Result available from another method

Client ID	Analyte(s)	Qualifier	Reason
SD-PCM22315	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Butylbenzylphthalate, Dibenz(a,h)Anthracene, Dimethylphthalate, Hexachlorobenzene, Hexachlorobutadiene, N-Nitrosodiphenylamine, Pentachlorophenol	R2	Result available from another method
SD-PCM22315	Phenol	U	Blank Contamination
Semivolatile Organic Selective Ion Monitoring (SIM) Analyses			
SD-PCM00115	2,4-Dimethylphenol, 2-Methylphenol, Benzyl Alcohol, Pentachlorophenol	UJ	Low surrogate recovery
SD-PCM00215	2,4-Dimethylphenol, 2-Methylphenol, Benzyl Alcohol, Pentachlorophenol	UJ	Low surrogate recovery
SD-PCM00315	2,4-Dimethylphenol, 2-Methylphenol, Benzyl Alcohol, Pentachlorophenol	UJ	Low surrogate recovery
SD-PCM00415	2,4-Dimethylphenol, 2-Methylphenol, Pentachlorophenol	UJ	Low surrogate recovery
SD-PCM00415	Benzyl Alcohol	R2	Result available from another method
SD-PCM00515	Benzyl Alcohol	R2	Result available from another method
SD-PCM00515	Butylbenzylphthalate	J	High CCV
SD-PCM00515	Pentachlorophenol	UJ	Low CCV
SD-PCM00615	2,4-Dimethylphenol	R,R1	Very low MS and MSD recoveries
SD-PCM00615	2-Methylphenol, Benzyl Alcohol, Pentachlorophenol	UJ	Low surrogate recovery
SD-PCM00715	Benzyl Alcohol	R2	Result available from another method
SD-PCM00715	Butylbenzylphthalate	J	High CCV
SD-PCM00815	2,4-Dimethylphenol, 2-Methylphenol, Benzyl Alcohol, Pentachlorophenol	UJ	Low surrogate recovery
SD-PCM01015	2,4-Dimethylphenol, 2-Methylphenol, Pentachlorophenol	UJ	Low surrogate recovery
SD-PCM01015	Benzyl Alcohol	R2	Result available from another method
SD-PCM01115	2,4-Dimethylphenol, 2-Methylphenol, Pentachlorophenol	UJ	Low surrogate recovery
SD-PCM01115	Benzyl Alcohol	R2	Result available from another method
SD-PCM01215	2,4-Dimethylphenol, 2-Methylphenol, Benzyl Alcohol, Pentachlorophenol	UJ	Low surrogate recovery
SD-PCM01315	Benzyl Alcohol	R2	Result available from another method
SD-PCM01515	Benzyl Alcohol	R2	Result available from another method
SD-PCM01615	Butylbenzylphthalate	J	High CCV
SD-PCM01715	Benzyl Alcohol	R2	Result available from another method
SD-PCM01715	Butylbenzylphthalate	J	High CCV
SD-PCM01815	2,4-Dimethylphenol, 2-Methylphenol, Pentachlorophenol	UJ	Low surrogate recovery
SD-PCM01815	Benzyl Alcohol	R2	Result available from another method
SD-PCM01915	2,4-Dimethylphenol, Benzyl Alcohol	R,R1	Very low MS and MSD recoveries
SD-PCM01915	Butylbenzylphthalate	J	High CCV
SD-PCM01915 RX	Benzyl Alcohol	R2	Result available from another method
SD-PCM02015	Benzyl Alcohol, Butylbenzylphthalate	R2	Result available from another method
SD-PCM02015	Pentachlorophenol	J	Low CCV
SD-PCM02115	Benzyl Alcohol	R2	Result available from another method
SD-PCM02115	Pentachlorophenol	UJ	Low CCV

Client ID	Analyte(s)	Qualifier	Reason
SD-PCM02215	Benzyl Alcohol	R2	Result available from another method
SD-PCM02315	Butylbenzylphthalate	J	High CCV
SD-PCM02415	Benzyl Alcohol	R2	Result available from another method
SD-PCM02515	2,4-Dimethylphenol, 2-Methylphenol, Pentachlorophenol	UJ	Low surrogate recovery
SD-PCM02515	Benzyl Alcohol	R2	Result available from another method
SD-PCM02615	Butylbenzylphthalate	J	High CCV
SD-PCM02715	Benzyl Alcohol	R2	Result available from another method
SD-PCM02815	Benzyl Alcohol	R2	Result available from another method
SD-PCM02915	2,4-Dimethylphenol, 2-Methylphenol, Benzyl Alcohol, Pentachlorophenol	UJ	Low surrogate recovery
SD-PCM03015	Benzyl Alcohol	R2	Result available from another method
SD-PCM03115	2-Methylphenol	N	Poor spectral match
SD-PCM03115	Benzyl Alcohol	R,R1	Very low LCS and LCSD recoveries
SD-PCM03115	Pentachlorophenol	UJ	Low CCV
SD-PCM03115 RX	Benzyl Alcohol	R2	Result available from another method
SD-PCM03215	Benzyl Alcohol	R,R1	Very low LCS and LCSD recoveries
SD-PCM03215	Butylbenzylphthalate	J	High CCV
SD-PCM03215	Pentachlorophenol	J	Low CCV
SD-PCM03315	Benzyl Alcohol	R,R1	Very low LCS and LCSD recoveries
SD-PCM03315	Pentachlorophenol	UJ	Low CCV
SD-PCM03315 RX	Benzyl Alcohol	R2	Result available from another method
SD-PCM03415	Benzyl Alcohol	R,R1	Very low LCS and LCSD recoveries
SD-PCM03415 RX	Benzyl Alcohol	R2	Result available from another method
SD-PCM03515	Benzyl Alcohol	R,R1	Very low LCS and LCSD recoveries
SD-PCM03515	Pentachlorophenol	UJ	Low CCV
SD-PCM03515 RX	Benzyl Alcohol	R2	Result available from another method
SD-PCM03615	Benzyl Alcohol	R,R1	Very low LCS and LCSD recoveries
SD-PCM03615	Pentachlorophenol	UJ	Low CCV
SD-PCM03615 RX	Benzyl Alcohol	R2	Result available from another method
SD-PCM20615	2,4-Dimethylphenol	R,R1	Very low MS and MSD recoveries
SD-PCM20615	Benzyl Alcohol	R2	Result available from another method
SD-PCM21215	2,4-Dimethylphenol, 2-Methylphenol, Pentachlorophenol	UJ	Low surrogate recovery
SD-PCM21215	Benzyl Alcohol	R2	Result available from another method
SD-PCM21815	Benzyl Alcohol	R2	Result available from another method
SD-PCM22315	Benzyl Alcohol	R2	Result available from another method
SD-PCM22315	Butylbenzylphthalate	J	High CCV

Client ID	Analyte(s)	Qualifier	Reason
Dioxin/Furan Analyses			
SD-PCM00115	Total HpCDF	J	Blank Contamination
SD-PCM00115	1,2,3,4,6,7,8-HpCDD, 1,2,3,4,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, Total HpCDD, Total HxCDD, Total HxCDF, Total PeCDF, Total TCDF	J	Blank EMPC results
SD-PCM00115	1,2,3,4,6,7,8-HpCDF, 1,2,3,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, OCDD	U	Blank Contamination
SD-PCM00415	Total HpCDF	J	Blank Contamination
SD-PCM00415	1,2,3,4,6,7,8-HpCDD, 1,2,3,4,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, Total HpCDD, Total HxCDD, Total HxCDF, Total PeCDF, Total TCDF	J	Blank EMPC results
SD-PCM00415	1,2,3,4,6,7,8-HpCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, 2,3,4,7,8-PeCDF, OCDD	U	Blank Contamination
SD-PCM00815	1,2,3,4,6,7,8-HpCDD, 1,2,3,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, OCDD, Total HpCDD	U	Blank Contamination
SD-PCM00815	1,2,3,4,6,7,8-HpCDF, 1,2,3,7,8-PeCDF, 2,3,4,6,7,8-HxCDF, Total HpCDF, Total HxCDD, Total HxCDF, Total PeCDF, Total TCDF	J	Blank EMPC results
SD-PCM01015	1,2,3,6,7,8-HxCDD, 1,2,3,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, 2,3,4,7,8-PeCDF	U	Blank Contamination
SD-PCM01015	OCDD	J	Blank Contamination
SD-PCM01015	1,2,3,4,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, Total HxCDF, Total PeCDF, Total TCDF	J	Blank EMPC results
SD-PCM01515	1,2,3,4,6,7,8-HpCDD, 1,2,3,4,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, Total HpCDD, Total HxCDD, Total HxCDF, Total PeCDF, Total TCDF	J	Blank EMPC results
SD-PCM01515	1,2,3,4,6,7,8-HpCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, 2,3,4,7,8-PeCDF, OCDD	U	Blank Contamination
SD-PCM01915	1,2,3,4,6,7,8-HpCDF, 1,2,3,4,7,8-HxCDF, 1,2,3,7,8-PeCDF, Total HpCDF, Total HxCDD, Total HxCDF, Total PeCDF, Total TCDF	J	Blank EMPC results
SD-PCM01915	1,2,3,4,6,7,8-HpCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, OCDD, Total HpCDD	U	Blank Contamination
General Chemistry Analyses			
SD-PCM01615	Total Organic Carbon	J	High lab triplicate RPD
SD-PCM01715	Total Organic Carbon	J	High lab triplicate RPD
SD-PCM01815	Total Organic Carbon	J	High FD Difference
SD-PCM21815	Total Organic Carbon	J	High FD Difference

10.0 Abbreviations and Definitions

DV Qualifier	Definition
U	The material was analyzed for, but was not detected above the level of the associated value.
UY	The reporting limit was elevated due to chromatographic overlap with related compounds. The material was analyzed for, but was not detected above the level of the associated value.
J	The analyte was positively identified. The associated numerical value is the approximate concentration of the analyte in the sample.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a tentative identification.
UJ	The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.
R	The sample result is rejected. The presence or absence of the analyte cannot be verified and data are not usable.

DV Qualifier	Definition
R1	This sample result has been rejected in favor of a more accurate, precise or conservative result. The other result should be used.
R2	This sample result has been rejected in favor of a more accurate, precise or conservative result from another analytical method. The other result should be used.

Abbreviation	Definition
ARI	Analytical Resources, Inc.
DV	Data validation
LCS	Laboratory control sample
LCSD	Laboratory control sample duplicate
EDL	Estimated detection limit
EMPC	Estimated maximum possible concentration
MS	Matrix spike
MSD	Matrix spike duplicate
NA	Not Applicable
RL	Reporting limit
RPD	Relative percent difference
RRM	Regional reference material
RSD	Relative standard deviations
SRM	Standard reference material

11.0 References

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